March, 1924

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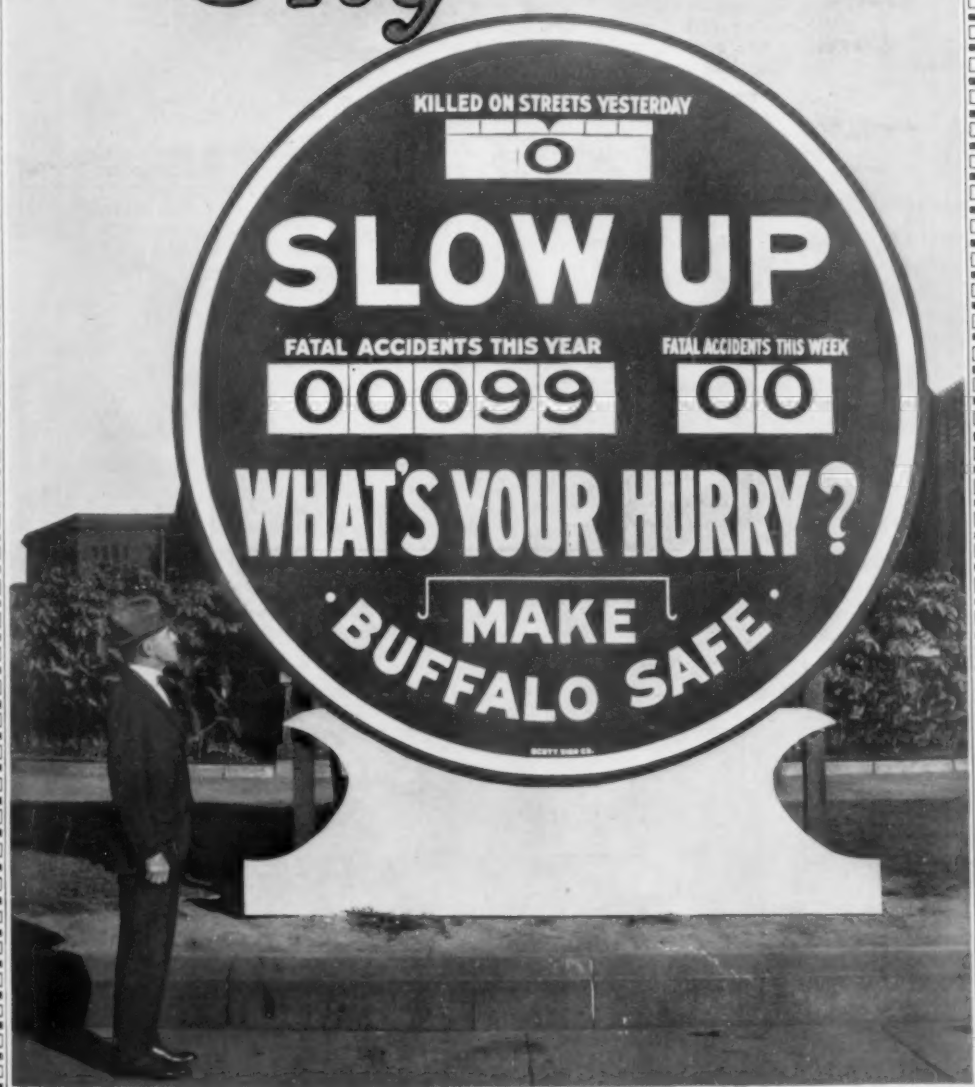
Vol. XXX No. 3
50 Cents $4 a Year

The American City



Photograph by courtesy of National Safety Council

Buffalo and Brooklyn Have Used This Effective "Mortometer" in Campaigns to Reduce Street Accidents from Automobiles

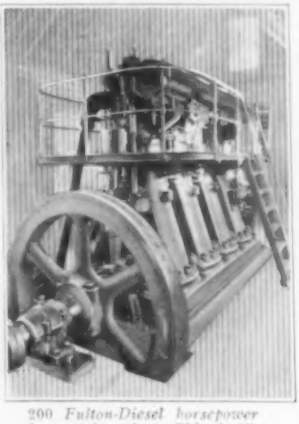
Fulton - Diesel reduces pumping cost 57 per cent

The Eldred Drainage and Levee District of Illinois operated a steam pumping plant at a cost of $2.89 per million gallons.

In 1921 it was replaced by a 200-hp. p. Fulton-Diesel, which has reduced the cost to $1.24 per million gallons—a saving of 57 per cent. Total saving (all items of cost considered), $7,912.08 per annum, which repays the entire Fulton-Diesel investment in about five years.

Drainage work is necessarily intermittent, as under normal conditions the engine only averages about six hours running time daily. Under uniform, full-time operation the Fulton-Diesel would effect a considerably lower unit cost.

This class of work, however, is a splendid illustration of the exceptional economy of the Fulton-Diesel. The engine can be stopped at any time and started again at a moment's notice. Fuel cost stops immediately, whereas with the steam plant the fuel cost continues because of standby losses. If the fires are allowed to go out, valuable time is lost when the pumps are needed again in a hurry.



200 Fulton-Diesel horsepower in pumping plant, Eldred, Ill.

That the Fulton-Diesel is capable of sustained effort was proved last spring when the engine was run continuously for 59 days to handle a head of water 13 feet above normal. Inspection at the end of the run showed it in perfect condition.

The application of Fulton-Diesel economies to your power problems is worth investigating. Anywhere and at any time, our staff of experienced Fulton-Diesel engineers will gladly consult with you and without obligation. Executives and engineers are cordially invited to visit our plant. We have a carefully prepared, fully illustrated booklet which describes the Fulton-Diesel in detail, of which a copy will be sent you, free and postpaid, upon request.

The facts and figures related above were secured by an independents engineering organization, and are given just as furnished in their report.

FULTON IRON WORKS COMPANY, ST. LOUIS, U. S. A.

Successful engine builders since 1852

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FULTON DIESEL

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Vol. XXX
No. 3

The American City Magazine

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High Surtaxes and Municipal Securities

A Reply to THE AMERICAN CITY's January Editorial on "Tax-exempt Securities, Tax Burdens and 'Municipal Extravagance'"

By Andrew W. Mellon
Secretary of the Treasury

PRIOR to the imposition of high surtax rates municipal securities had a well-defined and broad market. They were purchased by insurance companies and by conservative investors who no longer desired to continue their capital in private business. They sold upon an interest basis substantially the same as that on which they are now selling and were given preference, by reason of their sound character, over public utility and other private corporation bonds. With the imposition of the high surtaxes, the Federal Government in effect gave a bonus to the municipalities by way of a purely artificial value to the tax-exempt feature of a municipal bond. This value depends not at all upon any power of the municipality nor upon the intrinsic worth of the municipal obligations. We may say that by reason of this bonus the municipality saves one per cent in interest over what it otherwise would pay. It costs the Federal Government, however, to give this privilege, not one per cent of interest, but when the bonds are held by individuals with high incomes the Government loses 58 per cent of the interest. In other words, the municipality might save $10 a year on a $1,000 bond, whereas the Federal Government loses in taxes, when the holder has a large income, 58 per cent of $55, or $32 on a $1,000 bond. In other words, taking the two governments as a whole, the municipality makes only one-third of what the Federal Government loses.

There are now some $12,300,000,000 of wholly tax-exempt securities available to the large taxpayer, and more and more there is noticeable a flight of capital to these securities. We are bringing into existence a great mass of wealth which is entirely beyond the taxing power of the Federal Government or of the states. Such a type of security seriously threatens the usefulness of the progressive income tax.

I need only touch on the tendency of municipalities, by reason of the ease with which their securities are sold, of incurring heavy obligations to meet which heavy taxes must be imposed. This is one of the major contributing causes to the economic difficulties now affecting the Northwest. In the state of Arkansas, for instance, I am reliably informed the lien of these municipal bonds upon farm property leaves no equity upon which the farmers can borrow money, and farms are being sold for taxes by the hundreds. In that state much of the proceeds from the sale of municipal bonds has gone into roads which are worn out before the bonds mature.

A constitutional amendment is not a complete remedy. It will simply affect bonds subsequently issued. Relief from the intolerable situation existing on account of present outstanding tax-exempt securities

can only be had by a reduction of surtaxes to such a figure that the active man can afford to put his money into productive business and leave municipals to the field in which they belong—to the insurance companies and other conservative, inactive investors. If surtaxes are reduced, I believe that in time the effect of this reduction will be to reduce interest rates and in the end the municipality without the tax-exempt privilege will pay no more for its money than it does now with the tax-exempt privilege.

EDITORIAL NOTE.—Just two days after the foregoing letter was written, vote was taken in the House of Representatives on the proposal to remove, by constitutional amendment, the tax-exempt privilege from future issues of municipal bonds and other governmental securities. The proposal failed to receive the necessary two-thirds vote, and further attempt to secure its passage at the present session of Congress seems unlikely.

Notwithstanding the defeat of the proposal, THE AMERICAN CITY is glad to publish Secretary Mellon's letter as a clear and forceful outline of the Administration's point of view; but we are still of the opinion that the $12,300,000,000 tax-free bonds now outstanding, which were beyond the reach of the proposed constitutional amendment, would have offered sufficient refuge to enable individuals, so inclined, to escape high surtaxes during the continuance of abnormal Federal expenditures resulting from the war. On the other hand, if we assume with Secretary Mellon, that the tax-free privilege means a bonus of one per cent in interest rates to municipalities, the abolishing of this bonus would have affected every bond in all future issues, and not merely such portions of these issues as might be purchased by individuals with high incomes. Increased interest rates on municipal bonds would mean higher local tax rates. Is it not probable that the general public would thus have been compelled to pay, out of one pocket, in increased taxes a sum at least as great as they will lose from the other pocket by the continuance of the so-called bonus to municipalities?

As to the present high surtaxes, Secretary Mellon's argument for their reduction is strengthened, rather than weakened, by the action of the House of Representatives already mentioned.

THE AMERICAN CITY is, of course, in agreement with the Secretary of the Treasury as to the unwisdom of long-time bonds for short-lived improvements. We believe, however, that municipal practice in this matter is steadily improving, and that the problem is one for the states and municipalities to solve, rather than for paternalistic action by the Federal Government.

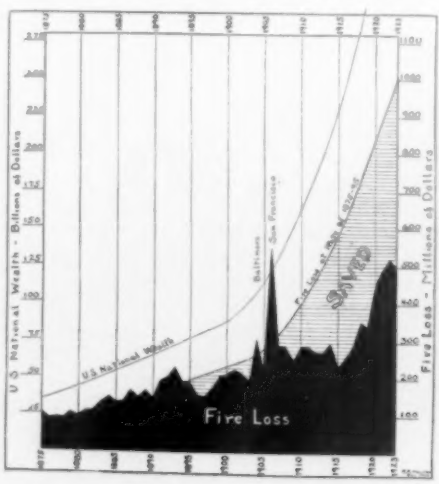
Relation of Fire Losses to National Wealth

ACCORDING to figures compiled by the New York *Journal of Commerce*, the fire losses for the United States and Canada for the year 1923 aggregated $389,192,200. This compares with $410,889,350 for the year 1922.

The National Fire Protection Association points out the fact that these newspaper estimates are admittedly inaccurate, but nevertheless furnish a valuable basis for comparison:

> "Since the organization of the Actuarial Bureau, its more authentic figures have largely superseded those of the *Journal of Commerce*, though the time required for compilation of complete statistics by the Actuarial Bureau necessarily so delays the publication of these final figures that the *Journal of Commerce* estimates must be relied upon for data on each year's losses until such time as the Actuarial Bureau's final figures are published. On the average for the years when both sets of figures have been available, the Actuarial Bureau's totals have been about one-third larger than those of the *Journal of Commerce*. Estimating on this basis, it may be predicted that final results will show that the 1923 total fire loss for the United States has been approximately $500,000,000.
>
> "While the total losses of recent years have been so enormous and have been increasing so rapidly that the results of fire prevention efforts have sometimes been questioned, the results seem much more hopeful if the fire losses be compared on the basis of national wealth, an obviously logical basis of comparison, instead of on an absolute basis."

A chart has been prepared by the National Fire Protection Association showing the relation of fire losses to national wealth from 1815 to 1923. In the period 1875 to 1895 the fire loss had a fairly constant relation to national wealth. After 1895 the fire-loss curve begins to fall away from the national-wealth curve, although peaks are shown representing the Baltimore and San Francisco conflagrations in 1904 and 1906. The chart shows that if the previous relation of fire loss to national wealth had been maintained, the 1923 fire loss would have been one billion dollars, just twice the actual estimated figures. The saving from 1895 to 1923 amounts to a total of approximately $4,330,000,000.


U S National Wealth - Billions of Dollars
Fire Loss - Millions of Dollars
U S National Wealth
Baltimore
San Francisco
Fire Loss at 2% of U S Wealth
Saving
Fire Loss

The New Rapid Sand Filtration Plant at Cambridge, Mass.

By George A. Johnson
Consulting Engineer, New York City

TWELVE years ago filtration of the Cambridge water-supply was recommended by Frederick P. Stearns, Professor Hector J. Hughes of Harvard, and Lewis M. Hastings, City Engineer of Cambridge. Two years later, after an investigation of the watershed, Professors George C. Whipple and J. W. M. Bunker of Harvard also recommended filtration. In 1915 the Cambridge Water Board recommended to the then Mayor and now Superintendent of the Water Department, Timothy W. Good, that such improvements be made, and the writer was engaged to engineer the job.

Plans for a rapid sand filter plant were submitted to the Water Board on October 15, 1915, and the ensuing fourteen months were occupied in hearings by the State Board of Health. Suspension of all other than absolutely necessary public works construction during the World War caused further delay until the present Mayor, Edward W. Quinn, recommended appropriation of the necessary money for construction, which was granted by the City Council in 1920. Contracts were executed on June 28, 1920, with Coleman Brothers, Inc., of Boston, and the Roberts Filter Manufacturing Company, of Darby, Pa.

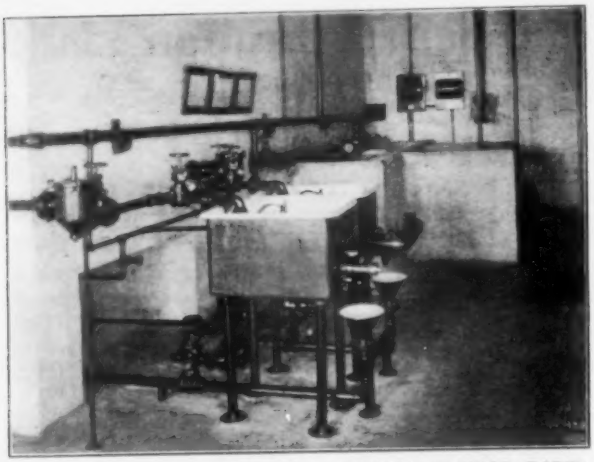
Ground was broken early in July, 1920, and thereafter construction proceeded rapidly until stopped by the severe winter of that year, during which no work was done for ninety consecutive days. The plant was finally ready for operation on April 6, 1923, and was started in full operation on April 25 and officially dedicated on June 28, 1923.

Source of Supply

The Cambridge water-supply is derived from a watershed lying in the vicinity of Waltham, Weston and Lincoln, upon which there is a resident population of some 30,000. The drainage area above the diversion point covers 23.57 square miles. The waters of Hobbs Brook and Stony Brook, which drain this area, are impounded in two reservoirs—one on Hobbs Brook and one on Stony Brook. The Hobbs Brook reservoir has a holding capacity of about 2,500 million gallons, and Stony Brook reservoir has an available capacity of slightly under 400 million gallons. Stony Brook reservoir, from which Cambridge takes its supply direct, is fed from Hobbs Brook reservoir through the natural channels of the brooks between the two reservoirs.

Stony Brook reservoir and the water filtration works are connected by 1.42 miles of 30-inch cast iron pipe, 0.91 mile of 36-inch pipe and 5.2 miles of 63-inch concrete conduit. At the lower end of this aqueduct the

GENERAL VIEW OF FRONT OF FILTER HOUSE AT CAMBRIDGE, MASS.



CHEMICAL DOSING APPLIANCES AT CAMBRIDGE, MASS., RAPID SAND FILTRATION PLANT

water passes direct by gravity to the filter plant, the excess being by-passed over a weir into Fresh Pond, which serves as a receiving reservoir. Fresh Pond drains an area of about one square mile and has an available storage capacity of about 400 million gallons of water.

Water Consumption

Very careful inspection of plumbing fixtures, and the prosecution of other lines of water conservation endeavor, have been instrumental, even in the absence of complete metering, in keeping the water consumption in Cambridge at the remarkably low figure of 100 gallons per capita. In the last twenty years the population has increased about 20 per cent and the water consumption about 27 per cent.

Quality of the Raw Water-Supply

Numerous investigations of sanitary conditions on the catchment area have been made in the last twenty or more years, notably by the late Frederick P. Stearns, Professor William T. Sedgwick, and more particularly by Professor George C. Whipple, of Harvard University. The conclusions arrived at as a result of these investigations were practically the same in all cases. Professor Whipple's investigation was made in 1912-13.

The watershed is similar to many others in the potentialities offered for dangerous contamination. From a population of about 120 per square mile this danger is always present. There are numerous cases where the brooks run parallel and close to highways, affording easy access of dangerous polluting matter to the streams.

There are strict sanitary regulations operative for safeguarding the water-supply of Cambridge. The difficulties of enforcing such regulations are clearly obvious, and it has long been recognized that their strict enforcement is impossible. Furthermore, no matter how diligent and efficient a watershed patrol may be, it cannot prevent the pollution of a water-supply derived from surface sources, whether the catchment area be populated or not. Protection of the Cambridge supply by purchase of the entire watershed was out of the question, and in consequence the Water Board has always continued its efforts toward minimizing the pollution of the raw supply, and such efforts are even now continued, although a sure safeguard against the entrance of disease germs into the distribution system of Cambridge is afforded by the filter plant at Fresh Pond.

The color of the Cambridge water-supply is of vegetable origin, coming from decaying vegetable growths in the swampy areas on the watershed. These swampy areas have been drained to some extent by ditching, but further work along this line is highly advisable, because by the swift draining of such areas the color of the raw water could be reduced to a material degree, and a substantial economy in the amount of chemical required for the removal of the color at the filter plant could be effected.

Some have claimed that the natural purification effected in the storage reservoirs is sufficient treatment to safeguard the purity of the supply. In Hobbs Brook reservoir the salutary effect of such purification by storage is far more pronounced than in Stony Brook reservoir, which is long and narrow and allows swift pasage of the water through it, especially following heavy

rains on the watershed, accompanied by a strong north wind. In this regard Professor Whipple in his report to the Water Board, dated December 17, 1913, drew pointed attention to the fact that water from the most dangerous feeder of Stony Brook conceivably could reach Fresh Pond in Cambridge within 48 hours, and possibly in a considerably shorter time than that.

A long series of analyses of the reservoir waters discloses an abundance of microorganisms, as would be expected, and it is such algæ growths that have imparted to the water-supply of Cambridge the obnoxious tastes and odors of which the people have so frequently complained.

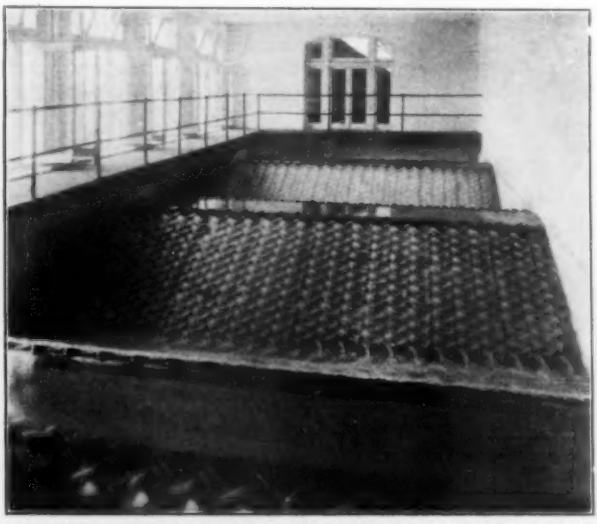
In the past all of the water-supply was delivered direct into Fresh Pond, adjacent to which is located the new filter plant. From Fresh Pond the water flowed by gravity into the pump well, thereafter being forced into the distribution system and Payson Park reservoir. The storage in Fresh Pond, which covers an area of some 170 acres, amounts to about one month's supply. The conformation of the shores of the pond encourages material purification of the water, and there is little opportunity for gross pollution from the some 9,000 persons actually resident on the territory adjacent to Fresh Pond. At the present time Fresh Pond is not utilized as a source of supply except at periods when the gravity flow to the filter plant direct from the conduit is insufficient to meet the demand.

Fresh Pond is a favorable breeding ground for algæ. Not only do algæ growths impart disagreeable tastes and odors to the water, but the organisms and débris resultant from such growths finding their way to the filters speedily clog them, thereby occasioning very frequent washing with the accompanying increased cost of operation. Sharp measures are always necessary during the spring and summer months to check the development of algæ. Treatment with copper sulphate of the waters of Fresh Pond, as well as those of the upper reservoir, destroys the objectionable growths.

Summed up, it may be said that the raw water-supply of Cambridge is derived from a quite heavily populated watershed, and that the raw supply is always open to the possibilities of dangerous contamination. The water is soft, the hardness averaging about 30 parts and ranging from about 20 to 40 parts per million, of which about one-half is temporary hardness. The color of the raw supply ranges from a maximum of about 50 to a minimum of about 20 parts per million and less, and averages about 25 parts per million. The water is substantially free from high amounts of turbidity. The bacterial content and the B. coli count are about what would be expected in a water of this character drawn from a watershed such as that described.

Purification Works

The purification plant has a capacity of 14 million gallons per twenty-four hours and can readily be enlarged to 16 million gallons. The raw supply is delivered to the plant by gravity through 1,480 feet of 42-inch cast iron pipe, leading from a weir chamber situated on the lower end of the 63-inch brick conduit which formerly fed Fresh Pond direct from Stony Brook reservoir. At times when the gravity flow to



AERATORS WHICH EFFECTIVELY REMOVE TASTE AND ODORS FROM CAMBRIDGE WATER

THE PUMP-ROOM OF THE CAMBRIDGE FILTER PLANT, SHOWING VENTURI METERS AND COMPLETE PUMPING EQUIPMENT

the plant is insufficient, the deficiency is made up by taking water from Fresh Pond through a 42-inch intake pipe 320 feet long connecting with the old draft conduit, and pumping through a 30-inch pipe to the 42-inch main supply line.

The purification works are located on city land about 200 feet from Fresh Pond and cover an area of about 1.6 acres. The plant consists of a covered coagulating sedimentation basin, 10 rapid sand filter units, filtered water aerator, clear-water basin, sterilizing equipment, wash-water receiving basin, low-lift pumping equipment and superstructures. The main structures are chiefly reinforced concrete of flat slab and beam and slab type. The superstructure is brick, and the roof is concrete.

The sedimentation basin is constructed of concrete, and is 137 feet by 96 feet and 16 feet in effective depth. Its working capacity is 1.5 million gallons, equivalent to a 2.5-hour flowing-through period when the plant is operating at full capacity. The basin is divided into two bays of equal size by a longitudinal party-wall. A distributing weir and downward baffle are provided at the inlet end. At the outlet end of the basin the water flows off over a skimming weir. Other accessories of the basin are distributing pipes for returned wash water, a sludge pump, overflow and gate chambers. The basin is separated from the clear-water basin by an earth bank 20 feet thick, which insures freedom from any possibility of pollution of the filtered water from this source. There are 10 filter units, built monolithically of concrete, and laid out in one row with a pipe gallery and operating platform along one side. The clarified water from the sedimentation basin is applied to the filters from a concrete flume running parallel to the pipe gallery. The filter tank units are 20 feet by 24 feet by 9 feet deep, and each has a filtering area of 480 square feet. Thus, when operating at normal capacity, each filter unit handles 1.4-million gallons per twenty-four hours. The filter floor is of the Wheeler bottom type.

The filtering medium is 27 inches in thickness, overlying 9 inches of graded gravel. The buildings and filter equipment are in general conformity with customary up-to-date modern practice, although somewhat more elaborate in certain particulars than that observed in most filter plants.

Conservation of Wash Water

A feature of this plant, which has been made use of in a few other places, is the idea of returning to the sedimentation basin the wash water discharged from the filters. This is effected by collecting the raw wash water as discharged in a covered concrete tank 37.5 feet in diameter and 10 feet deep. When filter washing commences, the wash-water return pump in this basin is started, returning the wash water to the inlet end of the sedimentation basin. There is a 12-inch overflow from this basin leading to the city sewer.

The results of the use of the returned wash water are two-fold: first, encouragement of coagulation activities in the coagulating basin through the medium of the returned wash water, which is heavily charged with precoagulated matters which operate as nuclei in the formation of new floes; and, second, in conserving to the utmost the limited water-supply derivable from the restricted catchment area. The practice is also of benefit in guarding against overloading the city sewer with waste water at inopportune times.

Clear-Water Basin

The clear-water basin is a covered reservoir having a capacity of 4 million gallons. It is 274 feet x 147 feet in plan and carries

a maximum depth of water of 13 feet when the aerator is in operation. The basin extends under the filters on one side, a filtered water conduit runs under the pipe gallery, and the basin is so arranged that it can be by-passed if necessary.

Aeration and Chlorination

The sterilizing equipment is assembled in the headhouse, chlorine being applied to the aerated filtered water. An aerator consisting of sloping concrete slabs in which are set sharp baffles arranged herringbone fashion, releases some free carbonic acid and offensive tastes and odors from the water.

Pumping Equipment

The pumping equipment consists of one 4-million-gallon, two 6-million-gallon and one 10-million-gallon horizontal centrifugal pumping unit to deliver raw water from Fresh Pond to the sedimentation basin when the gravity supply from Stony Brook is insufficient. There are two horizontal centrifugal pumps, each having a capacity of 1,100 gallons per minute, which deliver filtered water into a wash-water storage tank for use in cleaning the filters. There are two vertical centrifugal pumps, each of a capacity of 1,700 gallons per minute, which are utilized to return the used wash water to the sedimentation basin.

All pumps and chemical mixing machinery are driven by alternating-current, direct-connected motors, on a 550-volt, 3-phase, 60-cycle current. The wash-water tank is 29 feet in diameter and 34 feet in height and holds sufficient water to wash two filters in succession. Wash-water pumps start automatically to replenish the wash-water storage tank as soon as the washing of a filter begins.

The superstructure is a two-story building 223 feet x 71 feet. The wash-water tank is enclosed in a central tower. The first story of the main building is built of concrete, and the second is faced with tapestry brick with synthetic stone trim. The roof is of concrete covered with waterproof membrane. This building houses the filters, administration offices, laboratories, chemical storage, wash-water tank, pumps and all other machinery and devices.

Purification Process

The water first enters the sedimentation basin at the entrance, to which sulphate of alumina solution is added. The treated water is diverted at the entrance to the basin downward to the bottom thereof by means of a baffle, and thereafter passes slowly through the basin. The partially clarified water leaves the basin over a submerged wall which serves as a skimming weir. Thence the water flows through a 48-inch pipe to the influent flume of the filters, being admitted thereto through hydraulically operated sluice-gates on each individual filter unit. Passing the filters, the water is collected by the strainer system, and passed through registering controllers which maintain a constant rate of filtration. The filtered water then flows into a flume, below, through tubes with trapped outlets. Leaving the flume, the filtered water passes

VIEW OF THE FILTERS WITH CONTROL TABLES IN CAMBRIDGE, MASS., PLANT

over the aerator, thereafter receiving a dose of liquid chlorine as a final step in bacterial purification. The ultimate product flows into the clear-water basin and thence by gravity to the Fresh Pond pumping-station for distribution.

At times, particularly following heavy rains or thaws on the watershed, the alkalinity of the raw water falls so low as to make it necessary to add a small quantity of soda ash to the water as it flows through the 42-inch main supply line at a point about 100 feet from the sedimentation basin. This compensates for deficient alkalinity and insures complete decomposition of the added coagulant.

The sludge which accumulates in the sedimentation basin is from time to time pumped out by means of a vertical-shaft, motor-driven centrifugal pump, having a capacity of 1,500 gallons per minute. This sludge is discharged into a near-by sewer.

Cost of Construction

In numerous particulars this plant differs from others, and these facts tended to make its first cost greater than usually is the case. Kingsley Park is particularly attractive and demanded architectural features more ornate than in many places would be considered necessary. Furthermore, the Fresh Pond pumping-station is operating on a 16-hour schedule out of every 24, and this made it necessary to provide an abnormally large clear-water basin in which to store water against a 50 per cent overdraft during the pumping period. The aerator and the wash-water receiving tank with piping connections and pumping equipment are other unusual items. The long connecting pipe lines furnish still another abnormal item of expense.

COST OF CAMBRIDGE WATER FILTRATION PLANT
(Analysis from Final Estimate)

ITEM	Bid Price	Net Cost for Additions and Extra Work	Final Estimate	Properly Chargeable to Filter Plant
A Pipe lines outside of masonry structures	$90,000.00	$3,733.56	$93,733.56	$25,000.00 (a)
B Sedimentation basin, substructures of buildings and filter structures	328,000.00	35,406.05	363,406.05	271,000.00 (b)
C Superstructures	80,000.00	3,418.61	83,418.61	83,418.61
D Filter equipment	225,900.00	207.00	225,693.00	225,693.00
E Chlorinator	1,400.00	0.00	1,400.00	1,400.00
Total	$725,300.00	42,351.22	$767,651.22	$606,511.61

(a) Estimated cost of all outside piping, $89,850. Figure given is for normal amount of such pipe lines.
(b) Estimated cost of 4 m. g. clear-water basin $138,400. Allowance of $45,993.95 made for a basin of normal size.

Rated capacity of filter plant	14,000,000 gallons daily	
Bid price	$725,300.00	
Final estimate	767,651.22	
Extra work	42,351.22	(5.8%)
Allocated cost of filter plant	606,511.61	
Cost per m. g. rated capacity	43,322.26	

The filters are washed by passing currents of filtered water at high velocity up through the filter beds. The dirty water is collected in gutters at the top of the filters and drained off to the receiving basin, whence it is returned by pumping to the inlet end of the sedimentation basin. All valves in the filter and washing process are controlled from operating tables which are uncommonly substantial and ornate, being constructed of marble, bronze and plate glass.

ACKNOWLEDGMENT.—From a paper read before the New England Water Works Association Convention at Burlington, Vt.

National Garden Week—April 20–26

With the slogan, "The U. S. A.—Garden Nation of the World in 1930," and with the endorsement of President Coolidge, the General Federation of Women's Clubs is promoting the observance of April 20–26 as National Garden Week. Cooperating with the Federation are the Department of the Interior, through the Bureau of Education, the Department of Agriculture, through the Extension Service, the Forest Service and the Bureau of Plant Industry. A list of Garden Week suggestions and an outline of activities for each day of the week can be secured from Mrs. John D. Sherman, General Headquarters, General Federation of Women's Clubs, 1734 N Street, N. W., Washington, D. C.

The Public Works of the New Model Town, Mariemont, Ohio

By R. W. Horne

Fay, Spofford & Thorndike, Consulting Engineers, Boston, Mass.

MARIEMONT, an interesting example of modern town planning and development, is now under construction just outside Cincinnati, Ohio, along the sightly bluffs overlooking the Little Miami River. The completion of this town will achieve the goal of years of careful thought and planning on the part of Mrs. Mary M. Emery of Cincinnati and Charles J. Livingood, manager of Mrs. Emery's extensive properties. Mrs. Emery is to spend millions for the establishment of this modern community to promote the happiness and contentment of citizens of moderate circumstances and to provide, within their means, the conveniences and necessities of life consistent with present-day American standards of living; only a minimum property rental will be charged, which will be just sufficient to pay a moderate return upon the capital invested.

The Town

The development, comprising some 365 acres, will be provided with complete underground utility systems of the most modern and approved types. There will be about 11 miles of improved streets, paved in accordance with the best practice. Homes for a population of more than 7,000 people will be provided by constructing houses of various kinds, such as apartments, group houses, and semi-detached and detached houses. There will be ample opportunity for amusement and recreation, education and worship through the establishment of parks, playgrounds and athletic fields, schools and churches.

A feature of the town will be its attractive Town Center and Village Green, situated at the convergence of several important thoroughfares. About the Town Center there will be numerous public buildings and business establishments, including a town hall, library, community club house, hotel, theater, post office, bank, stores and business offices, and a public market place. Industrial sites with excellent railroad facilities will be available. The industrial area, when completely developed, will provide employment for 3,000 to 4,000 workers.

WATER-MAINS BEING LAID IN MARIEMONT, OHIO, READY FOR POURING LEADITE JOINTING MATERIAL

Utility Structures

Mariemont affords an exceptional opportunity for building each of the several underground utilities as a complete municipal unit and in accordance with a preconceived plan designed to serve the entire development. The installation of the water-supply, sewerage and storm-water drainage systems has been practically completed, and underground structures for the distribution of gas and electricity and heat from a central heating plant are to be built previous to the construction of streets and buildings. All service connections are to be installed as far as the property lines at the time of building the various utilities, thereby eliminating the need of disturbing finished

street pavements for such constructions. The evenness and regularity of the town site and the exceptionally favorable material encountered, namely, clay, silt and sand carrying scarcely any ground water, offered very favorable opportunity to use modern trenching and backfilling machinery, and much of this kind of equipment has been employed on the work. The stability of the trenches makes sheeting unnecessary where the depths are less than 12 to 14 feet.

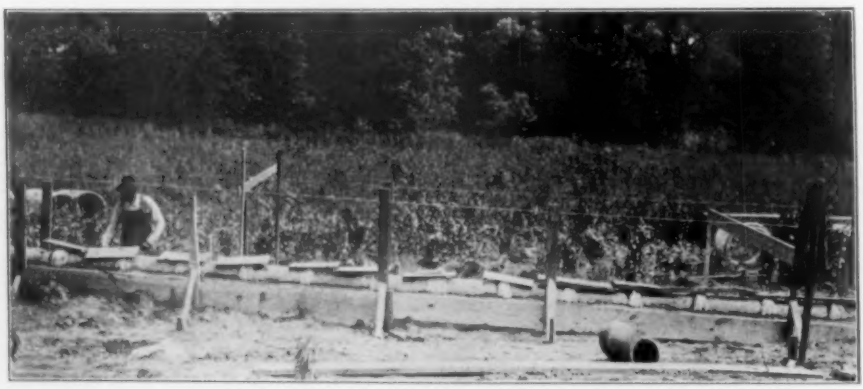
Water-Supply

The water-supply for Mariemont is taken from the mains of the Cincinnati waterworks; two entirely independent supply mains have been constructed to convey the water to the town site. The supply mains and the distribution mains are of cast iron, the supply mains being mostly 12 inches in diameter, and the distribution mains ranging from 6 inches to 12 inches in diameter. The entire distribution system is laid out as a gridiron with practically no dead ends. Gate-valves are so placed that in general only one side of a block will be shut off from water for making pipe line repairs. Fire hydrants are the 5-inch two-way type and are spaced at intervals of 300 to 350 feet. Hydrant branches are 6 inches in diameter and are provided with secondary gate-valves. Water-mains are assigned a standard location under the sidewalks where there will be a minimum damage and inconvenience from breaks. The mains are laid with a minimum cover of 3½ feet; Leadite joints are used throughout. Because of the corrosive activity of the Cincinnati water, the use of either lead or brass for all house service pipes was considered advisable. Pressures at Mariemont average about 150 pounds per square inch, thus making necessary the use of particularly strong pipe for house services. At the time of letting the contracts for the water system the cost of brass pipe compared very favorably with that of extra-heavy lead pipe, and in consequence the use of brass was adopted for all services.

Sewers

The separate system of sewers was adopted in order to keep the quantity of sewage a minimum, as sewage treatment will eventually be necessary. The separate system was advisable also because of the numerous opportunities for the discharge of storm water without going to the expense of carrying all storm water to a common point of discharge. Main sewers are entirely of vitrified pipe ranging from 8 inches to 20 inches in size. They have a standard location along the center lines of the streets. All sewers are designed large enough to serve the entire natural drainage area tributary to the system, whether this area is within or outside the town limits. The layout of sewers is such as to convey the sewage as rapidly as possible to one point by gravity, and discharge it through an outfall sewer into the Duck Creek intercepter, which is part of the Cincinnati sewerage system.

A feature of the system is a 10-inch cast iron siphon dipping 40 feet below the normal hydraulic grade line. The outfall sewer will be carried across a deep ravine upon a reinforced concrete highway bridge,



SEWER IN MARIEMONT, OHIO, SUPPORTED ON LEAN CONCRETE WALL WHERE THE GRADE OF THE SEWER LIES ABOVE THE NATURAL GROUND SURFACE

carrying special provision for supporting water-mains, sewers, and other utility structures. Several instances occur where sewers must be built a few feet above the natural ground surface in order to hold the proper gradient. These cases are where future streets will be built in fill; as a precaution against settlement, the pipes are supported on a wall of lean concrete.

Storm-Water Drains

The storm-water drains range from 10 inches to 66 inches in diameter; small sizes are of vitrified clay pipe, and sizes 24-inches or more in diameter are of precast reinforced concrete pipe. The drains are located in the streets a fixed distance from the sewers and on the opposite side from the water-mains. Abnormally large sizes of pipe are required in several instances, to provide for the run-off which originates on drainage areas outside the town limits, but eventually reaches the drains. The entrance of storm water into the drainage system will be entirely through street inlets, no catch-basins being provided. In a development such as Mariemont, streets will be kept practically free from dirt and other material which might enter the drains and clog them, and no trouble from this source is anticipated, especially as drains are built to produce self-cleansing velocities.

Cost of Utilities

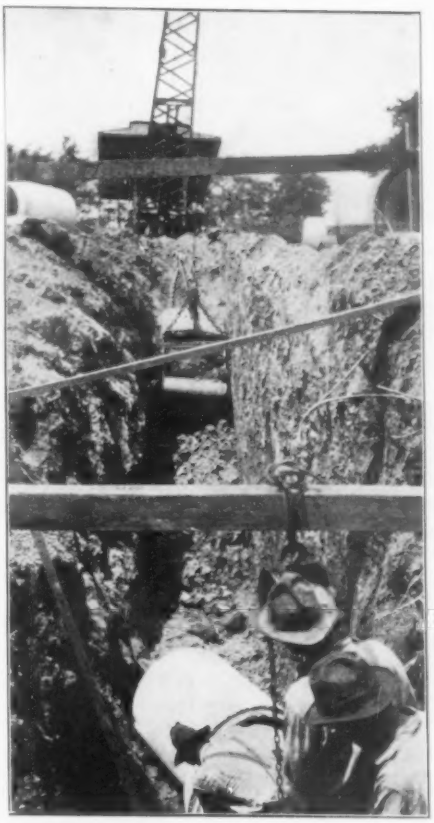
The cost of the two water-supply mains was about $72,000, and the cost of the water distribution system complete about $209,000. There are about 1.6 miles of distribution mains per 1,000 people served, and the cost of the complete distribution system, including house services but exclusive of supply mains, was about $18,000 per mile of main.

The sewer system cost about $126,000; there are 1.35 miles of main sewers per 1,000 people, and the cost of the complete system, including house connections, was about $12,800 per mile of main sewer.

The cost of the storm drainage system was about $249,000. There are 1.25 miles of main drains per 1,000 people, and the cost of the drainage system complete was about $27,900 per mile of main drain.

Highways and Highway Bridges

The town will have two important through-streets. One, Wooster Pike, passes through the center of the town, and the other, Mariemont Avenue, completely by-passes the Town Center and furnishes an alternate route for through-traffic. These two streets join at both the eastern and the western town limits.



DRAG-LINE MACHINE EXCAVATING TRENCH FOR DRAIN IN MARIEMONT, OHIO

The construction of a highway bridge is necessary in order to make the Mariemont Avenue route available. This bridge will be a simple reinforced concrete structure, 306 feet long, having seven narrow arch spans and a 35-foot roadway with two 6-foot sidewalks.

Paving

Several different types of street paving will be provided, depending upon the severity of traffic conditions. Pavements for heavy-traffic streets are to be sheet asphalt on a concrete base. The major through-streets are to be paved with bituminous

BACKFILLING DRAIN TRENCH BY MACHINE

macadam on a heavy base; other through-streets are to be a lighter type of bituminous macadam. Residential streets are to be either gravel or macadam having an asphaltic penetration top. Service streets about the Town Center will be of concrete.

Progress

Construction of the water-supply, sewerage and drainage systems was begun the first of May, 1923, and has been practically completed in about eight months' time.

The water system includes about 2.5 miles of cast iron supply mains, 11.5 miles of distribution mains, and 3 miles of ¾-inch brass service pipes. There are approximately 10 miles of vitrified sewers and 5 miles of 6-inch vitrified house connections. The storm-water drainage system includes 9 miles of vitrified clay and "precast concrete" drains and 2 miles of 6-inch vitrified roof-water connections. During 1924 it is expected that construction of the remaining underground utilities, the streets, the highway bridge, possibly the central heating plant and several hundred houses will be completed.

John Nolen, the town planner, has associated with him in the carrying out of this project Fay, Spofford & Thorndike, consulting engineers, of Boston, who prepared the engineering designs and are supervising the construction of the engineering features.

Municipal Ownership in the Manufactured Gas Industry

THAT the supply of manufactured gas to the municipalities of the United States is still to a very great extent under private management is shown by a compilation of available statistics on gas companies.*

Of the 966 gas utilities in the country, only 51, or 5 per cent, are municipally owned or operated, while the total annual sales of gas for the two classes show that those under municipal management are selling only 6,000,000,000 cubic feet, as against 365,000,000,000 cubic feet sold under private management, or 1.6 per cent.

Other figures on meters, miles of mains, and population served make the contrast even more striking. For example, of the more than 9,000,000 meters in use, municipal companies can account for less than 153,000. Of the 70,000 odd miles of gas-mains in the United States the municipal companies have less than 1,900, and out of a total of 45,000,000 people served by manufactured gas, only 762,000, or less than 2 per cent, get their gas from city-owned plants.

It is shown that the 51 municipal properties are situated in 21 states, the largest number of plants for a state being Minnesota, with 6; Virginia, with 5, and Georgia, Iowa, and Massachusetts, with 4 each. The largest plant under municipal control is in Omaha, Nebr., with total annual sales of 1,396,000,000 cubic feet. The next two in line are in Richmond, Va., with sales of 1,159,000,000 cubic feet, and Duluth, Minn., with sales of 802,800,000 cubic feet. These three companies alone, according to official statistics, sell approximately 80 per cent of the total amount of gas sold by all the city-owned plants in the country.

The remaining 20 per cent is sold by companies operating in small towns, summer resorts and hamlets, with 24 companies having less than 20 miles of gas-mains per company.

As against the 6,000,000,000 cubic feet of gas sold annually by all the municipal plants combined, it is shown that the People's Gas Light and Coke Company, of Chicago, sold 27,600,000,000 cubic feet, while other private undertakings reported such sales as Philadelphia, 18,000,000,000 cubic feet; Boston, 8,600,000,000 cubic feet; St. Louis, 7,000,000,000 cubic feet, and San Francisco, 6,000,000,000 cubic feet.

* "Municipal Ownership Survey of the Manufactured Gas Industry," issued January 30, 1924, by American Gas Association, New York, based on 1923 Edition, Brown's Directory of American Gas Companies.

Improving Our County Government

By Mary C. Hamilton

Secretary of the Westchester County Government Commission

AS far back as the year 1914, Westchester and Nassau Counties, in the state of New York, appointed commissions to examine their local governments and to suggest improvements thereto. The Westchester County Commission, as then constituted, consisted of four Republicans and three Democrats, and it is interesting to note that of these seven, six are still members. This commission in due time made its report and recommendations, but it was not until November, 1921, that a constitutional amendment was finally passed authorizing Westchester County to adopt a new form of government, subject, of course, to the approval of its citizens.

If you had journeyed to White Plains, the county-seat of Westchester County, the past year, you would have found a notable group of thirty public-spirited men and women, known as the Westchester County Government Commission, meeting from week to week in an endeavor to formulate a simple, workable plan for the local government of a community which has changed from mostly rural to almost entirely urban. To-day the population of Westchester County is approximately 400,000, made up of four cities, twenty-three incorporated villages and numerous hamlets, and yet the form of government is substantially the same that existed at the close of the Revolution, when the total population of the county (in 1790) was only 24,000.

A Neglected Unit of Government

County government to-day is the most neglected of all American units of government, particularly in the eastern part of the United States. The average voter will show a lively interest in city, state and national government, but for county government his concern is apathetic and his theories are hazy and impractical. The Joint Committee of the New York Legislature on Taxation and Retrenchment, in discussing county government, is quoted as saying:

"The old system of county government has broken down entirely in our purely urban counties, and leading citizens and civic bodies in those counties are already actively urging corrective legislation. . . . The mixed counties are in a most unhappy state. In them the old county system is slowly cracking under the tremendous and rapidly growing administrative burdens created by the rapid development of these counties."

While the problems confronting Westchester and Nassau Counties are in many respects peculiar to communities contiguous to large cities, there are many districts in the United States laboring under similar conditions. The two commissions are, therefore, afforded an opportunity of doing some pioneering in county government and of setting an example for other districts.

One of the questions often put to the Westchester Commission is, "What is the real trouble with our county government—the real cause of waste and inefficiency?"

Our answer is, that we lack a compact, logical organization of departments under one head, with adequate administrative and budgetary powers vested in that head.

For example, there are at present forty-one supervisors in Westchester County, eighteen of whom are town supervisors and as such are executive heads of the town government. In other words, the town supervisor is the chief officer of his town—he is a representative of his town on the County Board of Supervisors and as such fixes the town budget and has charge of all money matters.

The time has been when this governing body that we call our Board of Supervisors, which meets only at stated intervals, was sufficient for all needed governmental requirements in the county, but to-day, when the running of a county has become such a complex administrative problem, it needs

the constant and active supervision of a trained executive as well—some one who can be held responsible for the preparation of the county budget and for the proper administration of all departments of a county government.

Among other things which the Westchester County Commission has unearthed in its study of county problems, have been some 3,000 special and general laws, and some 4,000 amendments, that have been passed by the State Legislature at Albany, affecting Westchester County alone. A considerable saving and advantage might follow the creation of a county legislative body able to pass on strictly local laws, unmolested by the State Assembly.

The Commission has also discovered that under its present form of government Westchester County has 32 separate police departments; 32 separate departments of public works, or departments corresponding to it; nearly 50 different taxing districts; between 25 and 30 unrelated boards of health; the same number of independent purchasing departments; and about 130 people who can commit children to the poorhouse. Do you wonder that confusion and complication result from such a lack of coordination and cooperation?

Seventy-Two Justices of the Peace—What to Do with Them?

Another problem which has confronted the Commission is the one relating to inferior courts. At present there are seventy-two justices of the peace in Westchester County. The functions of these officers were established years ago to meet primitive rural conditions, and the officers are not required to be lawyers; in fact, most of them are untrained men. They become ex-officio members of the Town Board and in such capacity fill an executive as well as an administrative office.

In its consideration of this important question, the Subcommittee on Inferior Courts was unable to reach a unanimity of opinion and in consequence submitted two reports to the whole Commission, the majority report recommending the retention and preservation of the office of justice of the peace with certain specified changes in the present system, while the minority report advocated the abolishment of the judicial functions of justice of the peace as well as police justices in towns and villages, dividing the county outside of cities into districts and creating a District Court in the county to be presided over by lawyers of at least five years' legal standing. The views expressed by members of the Commission, following the filing of these two reports, showed such a wide difference of opinion that it was finally agreed to formulate the recommendations of this subcommittee into a separate report to be submitted to the Board of Supervisors.

In this connection it is interesting to note that the Nassau County Commission, in its preliminary report to the Board of Supervisors of Nassau County, recommended the abolishment of the office of justice of the peace and the creation in its stead of four local court districts, each to be presided over by a judge, elected for a term of four years.

Personnel of Commission and Recommendations in Final Report

In the selection of the thirty members who make up the personnel of the Westchester Commission, great care was exercised to gather together men and women with specific knowledge of the varied and technical problems to be solved. The Commission has operated through sixteen subcommittees and has been free, so far as restrictions were concerned, to recommend any form of government that it believes the electors of the county would approve.

In its final report to the Board of Supervisors the Commission will recommend the election of a County President who will be vested with the executive power of the county, with general supervision of all its affairs. In addition, there will be a County Vice-President, who will act as chairman of the Board of Supervisors, and a County Commissioner of Finance, who will be the chief financial officer of the county. These three elected officials will constitute a Board of Estimate and Apportionment, whose functions will include the granting of all franchises, incurring of all indebtedness, fixing the number, position and salaries of officials and employees not determined by statute, preparing and submitting the annual budget of the county, and having general supervision of all contracts and purchases for the county exceeding the sum of $500.

In like manner, the commission will recommend that the legislative power of the county be vested in a Board of Supervisors, elected from the units now represented in the Board, with authority to enact ordinances for the government of the county not inconsistent with law.

It has also been agreed by the Commission that its final report to the Board of Supervisors shall recommend the incorporation of broad general powers in the new county charter looking to the establishment of a County Department of Public Welfare; a County Health Department with a County Health Commissioner to work in connection with the State Board of Health; a County Board of Equalization and Review; a County Zoning and Planning System; a Bureau of Information and Statistics; a County Transit Commission; a County Park Commission, and a provision giving the county the right to construct and maintain water and sewer systems and public highways where these pass through more than one municipality.

Officials to Be Elected in Proposed Charter for Westchester County

With EXECUTIVE and ADMINISTRATIVE powers (These three officials to constitute the Board of Estimate and Apportionment.)	County Pres. County Vice-Pres. Commissioner of Finance (Comptroller)
With LEGISLATIVE power	Forty-one Supervisors (To be elected from each town and each ward in a city.)

SURROGATE
COUNTY JUDGE
JUDGE OF CHILDREN'S COURT
SHERIFF
DISTRICT ATTORNEY
COUNTY CLERK
REGISTER
COUNTY TREASURER

NOTE: All heads of Departments other than Commissioner of Finance and Commissioner of Jurors, to be appointed by County President.

The question of the educational reorganization of the county has also been given a great deal of study and consideration by the Commission. Owing to its great local importance, however, members of the Commission have agreed that the question of education should be treated separately from the question of a change of form of government, and they will, through their Subcommittee on Education, develop a plan for the reorganization and improvement of the public school system which will later be submitted to the State Legislature.

The construction to be placed upon some of the constitutional provisions, the extent to which power and responsibility can be lodged in one person, the limitations to be imposed upon the free exercise of the legislative power of the Board of Supervisors, are questions that have proved the great debating ground not only at the conferences of the Subcommittee on Questions of Law, but at the gatherings of the whole Commission. Because of a lack of unanimity on these important questions, it has been found wise to employ eminent constitutional lawyers to pass on certain unsettled questions before submitting the final draft of charter to the Board of Supervisors.

Inasmuch as the law providing for a change in our county government contains a provision that such proposed change must be submitted "to the electors of any such county at a general election in an odd-numbered year," the recommendations of this Commission cannot be voted upon by the people of Westchester County until the year 1925. This will give the Commission the time necessary to complete the details of its report, which must in the first instance be filed with the Board of Supervisors and then passed on by the State Legislature before submission to the electors of the county for their approval and adoption.

Throughout its deliberations the Commission has unanimously held to the belief that local interests, which constitute the very essence of responsible citizenship, shall not be ignored. Every function that can be maintained by the town, should, in the opinion of the Commission, be left to it, subject, of course, to supervisory check by the county. It is only functions such as water-supply, sewers, maintenance of highways, and general questions too big for any one municipality to handle, that the Commission would unify and coordinate; proper provision being made in the charter for the increase of powers and functions as public necessity demands.

Mansfield, Ohio, Resurfaces Brick Paving with Asphalt

By Carl H. Stander

Mayor and formerly Director of Public Service and Safety, Mansfield, Ohio

MANSFIELD, Ohio, has 44 miles of paved streets, which gives a larger percentage of improved thoroughfares, namely, 60 per cent, than in most cities. The first brick paving was laid approximately 40 years ago and, because of the quality of the brick, had become worn and cobbled.

Under the existing law, the city was compelled to assume 50 per cent of the gross cost, plus the cost of intersections for repaving. This, and a depleted treasury and rapidly soaring bonded indebtedness, made it impossible to repave a sufficient yardage each year to keep up with the yardage which was wearing out—without considering additional paving in the outlying districts.

All the streets that were in need of repair were in the business district. Merchants and business men are naturally adverse to having the streets in front of their places of business barricaded any longer than is absolutely necessary. Removing old paving material, excavating, placing concrete, hauling and laying brick is a season's work for many contractors. The loss of the use of the streets for such a length of time would have seriously complicated the traffic situation.

An examination of the old pavement showed that the old brick had worn to a fraction of their original size, but the substantial foundation, consisting of hard sandstone spalls 12 to 18 inches in depth, supported them. With ideal drainage conditions, these foundations, which had been compacted through years of use, could hardly be improved. Therefore, resurfacing was decided upon.

For the resurfacing work a 1½-inch wearing course and a 1-inch binder course, using Texaco asphalt, were selected. The new surface was placed on the worn brick after they had been thoroughly cleaned of dirt and other foreign matter. This type of improvement cost less than one-third the gross cost of repaving, and in no case was any business house without the use of the street for a period longer than 24 hours. About 25,000 square yards of roadway were resurfaced last year, including the four streets surrounding Central Park and comprising the route of both the Lincoln and Harding Highways through Mansfield.

THE PUBLIC SQUARE, MANSFIELD, OHIO, THE HEAVY-TRAFFIC STREETS OF WHICH ARE NOW PAVED WITH A TEXACO ASPHALT SURFACE OVER BRICK

THE CITY MOTOR EQUIPMENT OF LYNCHBURG, VA.

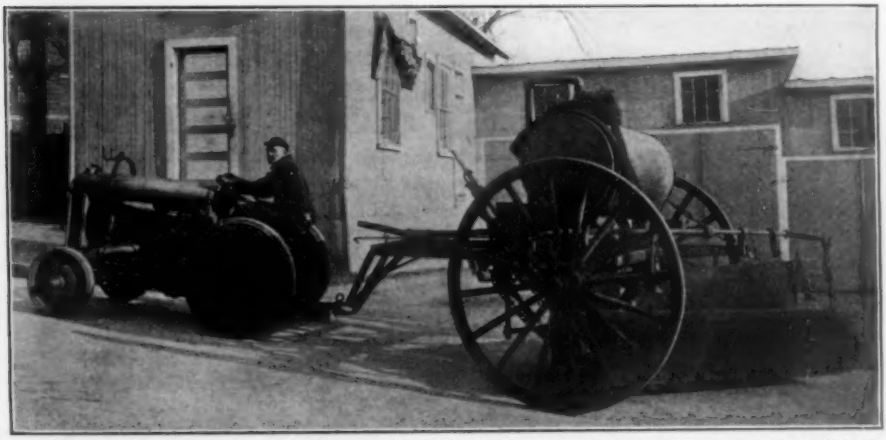
Motor Equipment in Service in Lynchburg, Va.

City a Firm Believer in Motorized Service

THE two illustrations appearing on this page show a portion of the motor equipment in use in Lynchburg, Va.

The city motor truck equipment for general city service now includes four ½-ton Fords, thirteen 1-ton Fords, one Fordson tractor, one 2-ton Jeffrey Quad, two 2-ton Nash Quads, two 3-ton FWD trucks, and two 3½-ton Kelly-Springfield trucks. This makes a total of twenty-four motor trucks and one tractor for general city service for a city of about 30,000 population.

The fire department equipment for Lynchburg, according to E. A. Beck, City Manager, consists of one Seagrave aerial ladder, four American-LaFrance pumpers, one Seagrave pumper, and one American-LaFrance hose truck.



A STREET-SPRINKLING AND CLEANING COMBINATION THAT HAS PROVED SATISFACTORY

This tractor-drawn street-cleaning unit, built in the city shops from an old horse-drawn sweeper with the addition of a tank, has replaced two pieces of street-cleaning equipment in Lynchburg

The Operation of Imhoff Tanks for Sewage Treatment

By Earle L. Waterman

Associate Professor of Sanitary Engineering, University of Iowa

THE Imhoff tank for sewage treatment is a two-story settling tank originally designed by Dr. Karl Imhoff and first constructed in 1905 by the Emscher Drainage Board in the province of Westphalia, Germany. After several years of successful operation in Germany, the Imhoff tank was introduced into America. The first tank of this type to be built in the United States was installed at Madison-Chatham, N. J., in 1911. Since that date Imhoff tanks have been built in nearly every state in the Union. It is estimated that about one-third of all sewage settling tanks used in municipal plants in the United States are of the Imhoff type.

The essential features of an Imhoff tank are the settling chamber, sludge compartment and gas vents. Sewage entering the tank flows through the settling chamber at such a low velocity that about 60 per cent of the settleable solids fall down to the sloping bottom of the settling chamber and then slide down through slots into the sludge compartment. The slots are so arranged that the gas, which is a by-product of the sludge digestion, cannot rise through the slots and into the settling chamber. In a septic tank, which is a one-story tank, the gas does rise through the sewage which fills the tank and in doing this lifts some of the partially digested sludge back into the sewage. As a result, the effluent (water flowing away) from the septic tank contains a higher percentage of suspended matter than that which leaves an Imhoff tank. Thus we see one of the important reasons for having a two-story tank.

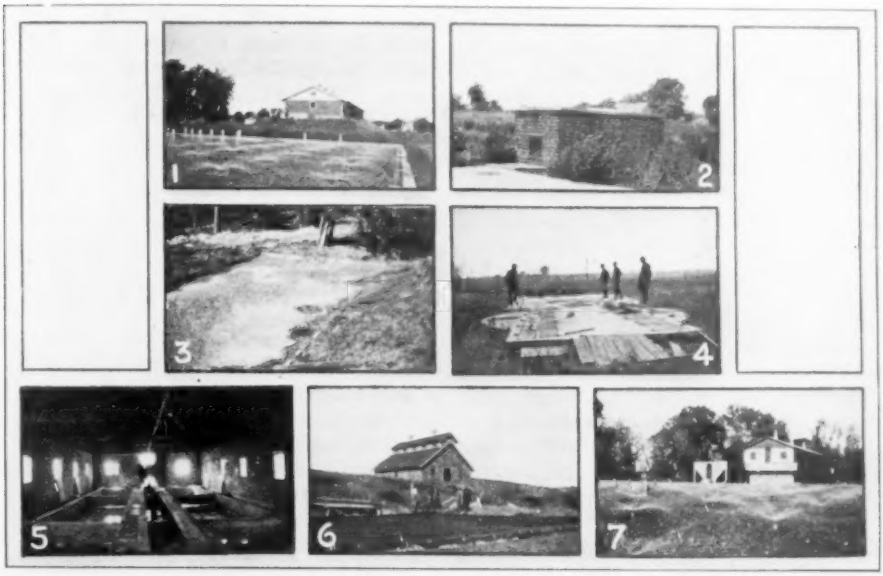
Besides preventing the resuspension of settled solids in the sewage, the design of an Imhoff tank also prevents the liquid as well as the gaseous products of sludge digestion from coming into contact with the sewage as it passes through the settling chamber. Experience has shown that by preventing such a mixture an effluent is obtained which is more readily treated in subsequent processes.

The compartment underneath the settling chamber, into which the solids fall as they pass through the slots, is called the sludge compartment. This is a storage space in which digestion or rotting of the organic matter which has settled from the sewage takes place. Digestion of this organic matter is very largely the result of the activities of innumerable bacteria. As the fresh particles of suspended matter come into the sludge compartment, the bacteria attack it and break it up into different products, some of which they utilize as food. During this process a considerable quantity of gases are formed, the principal one being methane, which is the same gas used for illuminating and heating purposes. Recently the engineers of the Emscher Drainage Board in Germany have devised a method for collecting the gas from Imhoff tanks so that it may be used. In one instance, the supply collected is sold to the municipal gas company and is used in the same way as that manufactured in the company's own plant.

In the Imhoff tank the gases which form during the process of sludge digestion rise until they strike the sloping bottom of the settling chamber, which deflects them into the gas vents, from which they discharge into the air above the tank. As the gas rises, some of the finely divided sludge is lifted by it to the surface of the gas vent, and in time a scum of considerable thickness is formed. If this scum is allowed to accumulate, it will act as a cover on the vent, which will be gradually lifted as the pressure of the gas below it increases, and will eventually be forced out over the sides of the vent and fall back into the settling chamber. In order to prevent this, it is essential that the scum be broken up frequently so that it will fall back into the sludge compartment and allow the gas to escape freely.

A considerable portion of the solids which fall into the sludge compartment is left after the bacteria have completed their

work on it. This is now what we call digested or ripened sludge and contains a very large percentage of moisture. As the tank continues in operation, there is a gradual accumulation of ripened sludge, and eventually the amount becomes so large that it is necessary to draw it out of the tank through the sludge pipe. Properly digested sludge as it is drawn from the tank has the appearance of thin, black mud. It usually flows readily and is allowed to flow out onto sludge drying beds. In fair weather it will drain and dry in a week or ten days so that it can be easily handled with spades. It should now resemble dark garden soil, and it has about the same physical characteristics.



TYPICAL SMALL IMHOFF TANK INSTALLATIONS IN IOWA

1. Housed Imhoff tank and outdoor trickling filters at Charles City, Iowa. 2. Housed Imhoff tank at Jewell, Iowa. 3. Imhoff tank sludge on drying-bed at Ames, Iowa. 4. Covered Imhoff tanks at Brooklyn, Iowa. 5. Interior view of housed Imhoff tanks at Ames, Iowa, showing settling-compartments and gas vents. 6. Housed Imhoff tanks, Iowa State College, Ames, Iowa, showing recently drawn sludge on the drying-bed. 7. Sewage treatment at Ames, Iowa, showing Imhoff tanks, dosing-chamber and trickling filter

Operating Procedure

If Imhoff tanks are to accomplish the results which they are designed to accomplish, namely, give an effluent comparatively free from suspended solids and the products of sludge digestion and produce a sludge which is free from disagreeable odors and will dry readily, careful and systematic operation of the tank is necessary. Experience has shown that attention should be given to the following schedule of operation:

1. *Cleaning screens and grit chambers.*—Coarse screens are usually installed for the purpose of removing coarse material, such as rags, pieces of wood, and other foreign substances from the sewage before it enters the Imhoff tank. These screens should be cleaned daily and the screenings buried. Where storm water is handled by the same sewer that carries the domestic sewage, grit chambers are built to remove the sand and other heavy material from the sewage before it flows into the Imhoff tank. Grit chambers should be cleaned after every heavy rain.

2. *Cleaning the sides and bottom of the settling chamber.*—Once every week the sides and bottom of the settling chamber should be cleaned. Very frequently growths attach themselves to these surfaces and serve as miniature catch-basins for the settling solids. Unless they are removed, undesirable septic action may be started in

the settling chamber. This cleaning should be done with a squeegee, a hardwood board 12 to 15 inches long and 3 to 4 inches wide, having rubber edges and attached to a handle which is of sufficient length to reach down to the slots in the bottom of the sedimentation chamber. A heavy chain attached to the end of a rod may also be used to clean the slopes and the slots in the bottom of the settling chamber.

3. *Removing floating material from the sedimentation chamber.*—Material which floats on the surface of the sedimentation chamber, such as grease, matches, corks, etc., and sometimes scum, should be removed with a skimmer and placed in the gas vent chamber. If this is not done, septic action may set in. As we have already noted, septic action is undesirable in the sedimentation chamber. A very satisfactory skimmer may be made from woven wire having about 10 meshes to the inch. A hoop of ¼-inch iron rod is attached to a long wood handle, and then the woven wire is bound to the hoop in such a way as to form a dish-shaped skimmer.

4. *Equalizing the deposit of sludge.*—If the construction of the tank permits, it is advisable to reverse the direction of flow through the sedimentation chamber. As the sewage flows through the tank, a large part of the suspended matter settles out near the inlet. This results in building up a sludge deposit which is higher near the inlet than it is at the outlet. By reversing the direction of flow once every month, a more even distribution of the sludge deposit can be obtained.

5. *Treatment of scum on the gas vent chambers.*—The scum which forms on the surface of the liquid in the gas vent chambers should be broken up at least once a day. If this is not done, the action of wind and sun will form a tough, leathery surface through which gas cannot pass. The result is that the scum is lifted by the confined gases and is sometimes pushed over the side walk of the vent chamber and falls into the sedimentation chamber. Even in Imhoff tanks, where housing protects the scum from weather action, there is often a tendency toward consolidation of the scum on the surface. The breaking up of the scum may be accomplished with hoes or by water from a nozzle. In one case which has recently been reported a walking beam has been arranged so that continual agitation of the scum in the vent chambers is obtained. This of course requires some kind of power, but in the case referred to, the results have apparently justified the expenditure for equipment and power. This matter of keeping the gas vents functioning properly seems to require more attention on the part of the operator than any other single phase of Imhoff tank operation.

6. *Observing depth of sludge.*—It is important to know the depth of sludge in the sludge compartment. Observations to determine this depth should be made at least once a week. If the sludge compartment is divided into two or more pockets, the depth of sludge should be determined in each pocket. This may be done by means of a sheet-iron plate 12 to 18 inches square attached to a wire or cord or long, light, wooden rod in such a manner that it will sink in a horizontal position. When it reaches the top of the sludge, the rate of sinking will be checked, and at this point the depth should be observed. This observation can generally be made through the gas vent chambers.

7. *Drawing sludge.*—In a normally operating Imhoff tank, sludge should be drawn when the sludge compartment is filled to within 20 inches of the slots. The valves in the sludge outlet pipes should be opened very slowly. As the sludge begins to flow freely, close the valve, let it remain closed for two or three minutes and then slowly open it again. By doing this, a chance is given for the heavy sludge in the bottom of the sludge pockets to start moving toward the sludge pipe. Quick opening of the valves may result in drawing sludge from the top instead of the bottom of the compartment. It is the bottom sludge that should be removed. If there is water supplied to a perforated pipe near the bottom of the sludge compartment, the valve controlling it should be opened just before sludge is to be drawn.

There is danger of drawing too much sludge at one time. A certain amount of digested sludge should be left in the tank to seed the sludge compartment. Otherwise the process of sludge digestion will be temporarily retarded each time the sludge is drawn. No fixed rule for determining the proper amount of sludge to draw at one time can be given. It is the writer's

practice to close the sludge valve when the outflowing sludge begins to change from a black to a gray color. However, this rule probably will not be applicable to all tanks, and each operator must learn from experience when to stop drawing the sludge.

In addition to drawing sludge when the sludge compartment is nearly filled, it is often advisable to draw the sludge in small amounts when there is any evidence of "foaming" in the gas vents. The writer believes that it is better policy to draw small quantities of sludge frequently rather than large amounts at long intervals.

8. *Drying sludge.*—A well-drained sludge drying bed is a necessary accessory to an Imhoff tank. Sludge drawn from the tank is either pumped to, or flows by gravity to, the sludge bed. It is not advisable to cover the bed to a depth greater than 12 inches. In from ten days to two weeks after it is applied to the sludge bed (during fair weather) the sludge should dry enough to be easily removed with hoes and shovels. This should be done promptly, so that the bed may be ready for the next dose of sludge. In some cases the drawing of the sludge may be hastened by mixing a solution of alum with the sludge just before it enters the drying bed. Recent experience at Plainfield, N. J., where 1.35 pounds of alum per cubic yard of wet sludge was applied to the sludge, indicates that a considerable saving of sludge drying time can be effected. The method of applying the alum is very simple.

Operating Problems

The difficulties encountered in the operation of Imhoff tanks may be summarized as follows:

1. Occurrence of septic action in the sedimentation chamber, which results in a cloudy, odorous effluent
2. Clogging of slots, which prevents proper disposition of sludge
3. Clogging of sludge pipes
4. "Foaming" at the gas vents

In a well-designed Imhoff tank most of these difficulties arise as the result of inefficient operation and may be overcome by carefully following the operating procedure outlined above. In some instances, however, troubles are the result of faulty design. It may be that the designer has not fully understood the principles which control the operation of an Imhoff tank, but more often trouble arises from the fact that the tank is called upon to do more work than the designer planned it to do. Whatever the reason for operating difficulties, it is surprising to see what can be accomplished by a careful, conscientious, and skilled operator.

Prevention of septic action in the sedimentation chamber, of clogging of slots and sludge pipes, may all be prevented by following the suggestions which have been made. When the sludge pipes do become clogged, however, there are different ways of getting them cleaned out. If water under pressure is available, a hose with attached nozzle may be dropped down the sludge pipe. A stream of water from the nozzle will frequently dislodge the obstruction. If this does not succeed, a soil augur attached to a shaft of sufficient length to reach the bottom of the sludge compartment should be tried. By twisting the augur and lifting it carefully, the obstruction may be removed. If an augur is not available, a hook will serve the same purpose. Usually the obstruction is formed by rags, and this fact should be kept in mind when attempting to clean out the sludge pipe. In some cases, however, the clogging is due to the solidification of sludge.

"Foaming" is an abnormal boiling in the gas vents. Under certain conditions gas seems to be produced in large quantities in the sludge compartment and rises so rapidly in the vent chambers, carrying finely divided sludge with it, that the scum on the vent chambers is lifted until overflow takes place. The causes of foaming seem to vary. Overloading of the plant, excessive accumulation of sludge, inadequate gas vent area, oil from garages, septic sewage, and wastes from creameries have all been charged with causing foaming conditions.

During the past summer the writer had some experience with foaming in an overloaded tank and has seen the gas vents boil over five times in one day in spite of thorough hosing of the gas vents. The sludge produced by the tank in question had a practically neutral reaction—it was neither acid nor alkaline to litmus. And yet the addition of hydrated lime to the tank every other day certainly decreased the foaming tendency, although it did not entirely eliminate it. The tank in question was designed in 1916 to treat the sewage

from a population of 2,000; the sludge compartment had a capacity of 2,500 cubic feet, or 1.25 cubic feet per capita. The tank is now receiving sewage from a population of 3,000—hence the overloading. Experience seems to indicate that a sludge capacity of 2 cubic feet per capita should be provided. The permanent remedy for an overloaded tank is obvious: additional tank capacity should be provided.

Drawing of sludge frequently and in small amounts will often correct foaming conditions. In some cases the installation of fine screens ahead of the Imhoff tank is efficacious. Such a procedure really amounts to reducing the load on the tank. Wastes which make the sewage acid, such as those from creameries, should be treated separately. If for any reason they are temporarily present, lime should be added to neutralize them.

Conclusion

The operating difficulties which are met in operating an Imhoff tank can be very largely eliminated by following an operating schedule which calls for the performance of certain duties at regular intervals.

If difficulties arise which are not overcome by ordinary methods, it is advisable to consult an experienced sanitary engineer.

ACKNOWLEDGMENT.—From a paper read before the Conference on Sewage Treatment held at the Iowa State College under the auspices of the Engineering Extension Division.

Removing Ruts from Gravel Roads

EXPERIMENTS covering several months on a gravel road in southern Indiana have shown that it is possible to keep ruts or corrugations out of this type of road surface, according to A. K. Hinkle, Maintenance Superintendent, State Highway Commission of Indiana. The methods of overcoming these corrugations is simple and unique. In the main, it consists chiefly of crushing gravel and stone so that it will pass through a 1-inch screen, and applying the dust along with the screenings. With proper and systematic maintenance, dust will almost eliminate ruts, the most annoying features of gravel and stone road travel.

Corrugations are formed in gravel roads when traffic reaches a certain density, and are due to the vibration of the car combined with the slipping or "kick-back" of the drive wheel as it drops into the trough of the corrugations. Corrugation development is accelerated after a rain by water splashed out of the depressions and carrying with it some gravel and sand. This accounts for the faster development of corrugations on flat grades. Corrugations develop faster in gravels lacking cement material and in those deficient in coarser pebbles. Gravels with an excess of fine silica sand of no cement value corrugate readily.

The corrugations in roads can be greatly reduced by the addition of a thin coat of crushed gravel passing a 1-inch opening and containing all the dust incident to crushing. Crushed limestone of the same grade can also be used in the same manner. Roads made of limestone and maintained by the dragging process, the same as gravel roads, corrugate much less than the average gravel road. This is due to the stone, which apparently has a greater cementing value. Stone roads not properly maintained are more inclined to develop potholes, instead of the rhythmic corrugations developed by gravel.

Building Permanent Culverts and Small Bridges

BECAUSE small bridges and culverts are the most permanent features of modern highway construction, with the possible exception of the location and grade work, William J. Titus, Bridge Engineer of the Highway Commission of Indiana, states that they should be built for permanence and to withstand the heavy truck usage of modern overland transportation.

One of the big problems of state road construction to-day is the thousands of small and weakly constructed bridges that are hazardous to increased traffic, which runs up to 20 tons per vehicle. Many of these bridges were designed when roads were single-track affairs, and have foundations too weak for the support of modern traffic. Under no conditions should new bridges be less than 18 to 20 feet wide, and they should be able to support 20-ton traffic. If such a plan is adopted, it means a great saving to taxpayers everywhere, for when roads with these modern bridges become a part of the state highway system, the bridge problem is solved, and, after all, the people pay for the improvement, whether state, county or township builds it. Foundations are most important in bridge construction. The difficulty to-day is that many smaller county bridges have foundations in sand or on streambeds. When there is a question of doubt, foundations should always be on piling. The day of the tread board or "half-sole" floor of bridges is past, because motorized traffic cannot keep on this track and is shunted to either side, destroying the side walls of the bridge.

Does Pavement Maintenance Cost More Between Tracks Than Elsewhere?

By R. C. Cram

Engineer, Surface-Roadway, Brooklyn-Manhattan Transit Corporation

IN the recent conferences between municipal and railway engineers on the subject of track pavements, and in certain articles recently appearing in the technical press, there has been an insistence upon the part of municipal representatives that it costs more to maintain pavements in railroad streets than in non-railroad streets.

Certain data bearing upon such maintenance costs as obtaining in Brooklyn, N. Y., have been quite widely quoted, and G. W. Tillson makes the following statement of Brooklyn costs in *Engineers and Engineering*, published by the Engineer's Club of Philadelphia.

"During the years of 1913 to 1918 inclusive the cost of repairs to asphalt pavements in Brooklyn, N. Y., on car track streets in the areas outside of the railroad area, averaged $0.039, while on streets without car tracks it was $0.022 [per square yard]."

It has interested the writer to examine the records of the railroad companies in Brooklyn, with the view of determining what their costs for paving maintenance may have been as compared with the city costs just quoted. For a period of about 10 years the engineers of the companies have kept a careful record of the maintenance cost of tracks, and the following statistics are available:

The railroad companies maintain approximately 2,200,000 square yards of pavements of all kinds in the boroughs of Brooklyn and Queens. Of this total, 261,000 square yards are paved with asphalt, principally in the 2-foot strip adjacent to the outer rails, but with a considerable portion within the rails as well. The larger part of this asphalt area is adjacent to tracks whose average age is about 17 years and whose maximum age is 29 years.

But the principal pavements between the rails are block pavement, usually granite, with some wood block, Belgian and slag block, brick and even cobblestones. Approximately 1,500,000 square yards of these block pavements are on a concrete base.

During the years 1915 to 1918, the average annual cost for maintenance of these pavements for wear only (not including the repairs or repavement made following track work of any kind) was $102,972.00, or $0.047 per square yard yearly. This unit covers all kinds of track and pavement and compares very favorably with that quoted by Mr. Tillson for asphalt only, being but $0.008 greater. Mr. Tillson's units are also subject to several interpretations. He notes a greater maintenance unit cost of $0.017 per square yard for railroad streets than for non-railroad streets, but it will be seen that the railroad unit cost above given is nearly the same as the city cost for railroad streets. The railroad costs are principally for areas paved with block pavements, which are more costly to maintain than asphalt.

Meanwhile it should be borne in mind that railroad streets are generally important arteries and that a much greater pavement wear must be expected, not only on the railroad area, but also outside thereof, on such streets. It is by no means scientific simply to compare costs of maintenance of pavements on railroad streets with those for non-railroad streets without considering traffic, and Mr. Tillson himself has said that the figures he quoted prove nothing, but he believed they are indicative. They certainly are indicative of the probability that pavement maintenance on railroad streets is no more costly within than without the railroad areas, taken as a whole, and probably if taken in proportion to traffic carried, the annual maintenance may be less than that on non-railroad streets. The rails certainly have prevented a great deal of wear by relieving the pavement through transference of a large part of the loads to the rails.

In 116 miles of the more modern track, built in Brooklyn since 1907, for which we have a very good record of paving maintenance costs covering tracks varying in age from 1 to 12 years and having an average age of 5 years, taking the average of the

expenditures for the years 1915 to 1918 inclusive, we find unit expense of $0.031 per square yard per year for the 4 years covered. This unit is slightly less than the city area unit of $0.039.

Again we find, to bring in the influence of the high costs of all items since 1917, down to January 1, 1923, that the pavement in 160 miles of track varying in age from 1 to 16 years and having an average age of 8 years, has a unit expense of $0.041 per square yard per year. This unit will be seen to compare most favorably with the city area unit of $0.039 for the period from 1913 to 1918, which was practically uninfluenced by war-time costs and by the post-war costs which have prevailed since 1918.

ACKNOWLEDGMENT.—From a paper read before the Governmental Research Conference, Washington, D. C., November 16, 1923, under the auspices of the National Municipal League. See article by the same author in THE AMERICAN CITY, January, 1924, pages 26-28.

Small-City Park Development Through Community Cooperation

By H. E. Inlow

Chairman, Park Committee City Planning Commission, Pendleton, Ore.

THROUGH cooperation of various civic agencies, a comprehensive plan for the development of parks and for general civic beautification is now being effected in the city of Pendleton, Ore. When carried to completion the plan will provide this progressive western city with one of the best systems of parks and playgrounds to be found in any community of its size and will stand as a lasting monument to the spirit of cooperation and community enterprise which exists there.

The City Planning Commission, created under state law some two years ago, has since its organization been conducting a study, with the aid of experts, of the needs, possibilities of improvement and desirable features and types of improvement for the community. These plans having progressed to the point where they were ready to be consummated, the question of financial and cooperative aid has this year found a happy solution. The Pendleton Round-Up Association, which since 1910 has presented an increasingly famous and popular frontier exhibition and whose officers and members each year give largely of their time and effort to this enterprise without salary or other compensation except the gratification which arises from viewing a work well done and appreciated, found itself this year with a balance of more than $10,000 on its books.

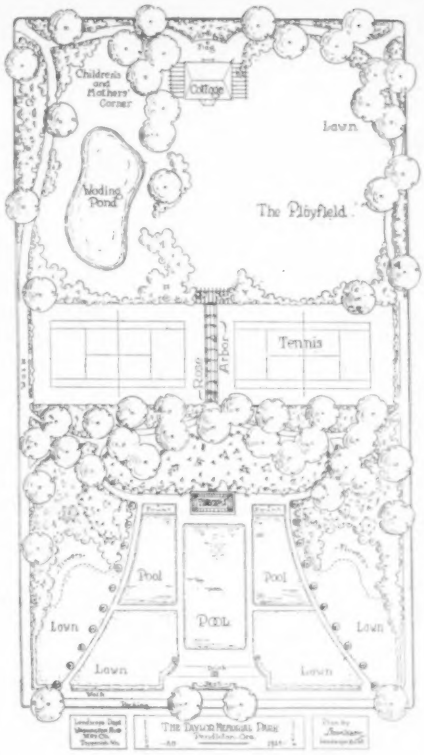
AIRPLANE VIEW OF THE ROUND-UP IN PENDLETON, ORE.

By action of the Association the entire amount was appropriated for the development and improvement of parks in the city of Pendleton.

Another agency participating in this program of civic improvement is the Til Taylor Memorial Association. When in July, 1920, that famed western citizen and sheriff, Tilman D. Taylor, was killed by bandits, his friends and admirers in all parts of the state and country created a fund to be used for the perpetuation of his memory. This fund, known as the Til Taylor Memorial fund, has reached such proportion that the association having it in charge has decided to proceed with its expenditure in the establishment of a memorial.

By action of the City Council a large block of land centrally located and facing a transcontinental highway, the Old Oregon Trail, was designated as the Til Taylor Memorial Park and Playground. Plans for the improvement of this block have been drawn under the direction of the City Planning Commission, providing for the use of approximately one-half as a formal setting for the Til Taylor Memorial, which is to be an equestrian figure of heroic size. This figure will have a background of shrubs and forest trees common to this section of the Northwest. In front of it is a scheme of lawns and large reflecting pools to enhance the beauty of the setting. The remainder of the block is laid out along modern lines for playground purposes.

In addition to this project, improvement through landscaping and planting is being made in other parks of the city, including the Round-Up Park itself, a plot of ten acres or more where the famous western show is held and where annually hundreds of Indians from the Umatilla Indian Reservation place their tepees while they participate in the exciting events.



PLAN OF TAYLOR MEMORIAL PARK, PENDLETON, ORE.

Altogether, some five park centers will be ultimately established and improved, aside from the planned improvement of street parkings and school grounds. In addition to these plans a municipal auto camp park, near the intersection of the Old Oregon Trail and the Oregon-Washington Highway, has been developed and improved for the accommodation of the thousands of tourists from near and far who pass over these roads annually.

Plans Progressing for National Music Week

ALREADY forty-three communities in the United States and one entire state have signified their intention of organizing local observances in cooperation with the first National Music Week, May 4-10, 1924, and hundreds of other towns and cities, of which a large number have already manifested interest in the movement, are expected to participate, according to a report made by C. M. Tremaine, Secretary of the National Music Week Committee, at a recent meeting of the committee.

The Committee's function, Mr. Tremaine said, will be principally to furnish necessary guidance and material for the successful organization of local efforts. Communities contemplating putting on local Music Weeks can get full details as to the best manner of running them, by communicating with the National Music Week Committee, 105 West 40th Street, New York, N. Y.

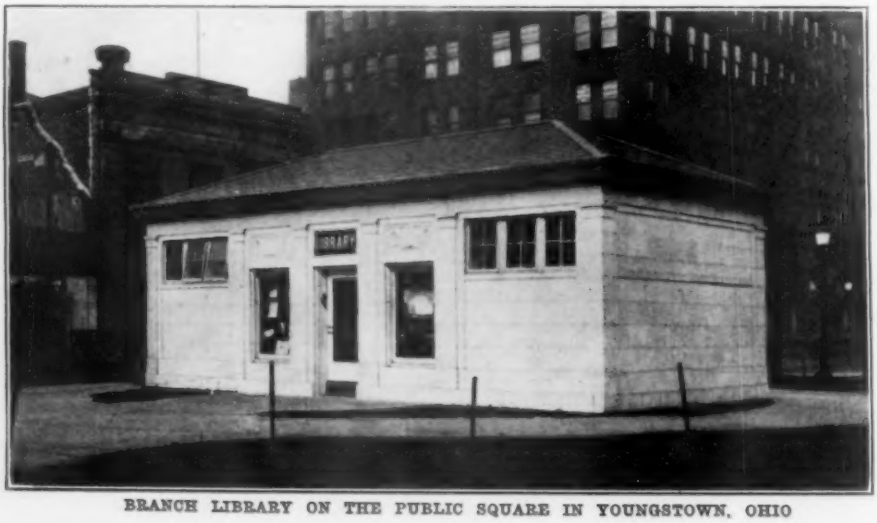
Forward Steps in Municipal Affairs

How Youngstown Secured Its Unique Branch Library

YOUNGSTOWN, OHIO.—The new branch library erected on the Public Square in the heart of the city of Youngstown is unique not only in its unusual location, but in the fact that the materials and labor for its construction were donated by local labor unions, material-men, manufacturers and other public-spirited citizens.

The location of the main Public Library at some distance from the business center of the city has made it difficult in the past for the working people to take full advantage of the supply of books available for distribution. The first definite steps to remedy this difficulty were taken last summer, when the library authorities took up the question of installing a circulating branch of the main library on an available plot in the Public Square. It was decided at that time to suggest that the various local building trades unions donate the labor for the erection of the building. The willing response on the part of the labor unions to this proposal, and the gifts of building materials and furnishings, as well as cash donations which were soon received, gave evidence of the fact that the people of Youngstown have a real appreciation of the service rendered by the Public Library. Actual construction work was begun early in October last, and in two months from that time the library was opened to the public. The building as it now stands is an example of fine workmanship in every detail, and is a distinct credit to all those who took part in its erection. One of its interesting features is that it stands on a steel base. This will make it possible for the library to be transferred to another location at some time in the future, should changes in business and traffic conditions make it advisable to do so.

This new branch library accommodates approximately 5,000 volumes, the majority of which are on business and technical subjects. Fiction service is not neglected, however, and in addition to a good assortment of new books, attractive editions of the standard classics have been supplied. The use of this library is limited to persons



BRANCH LIBRARY ON THE PUBLIC SQUARE IN YOUNGSTOWN, OHIO

SILVER CUPS AWARDED IN THE VILLAGE IMPROVEMENT CONTEST IN CLARINDA, IOWA
The one in the center was awarded for the home having the highest grade in the entire city, which also won the special cup for Stuart Street

over eighteen years of age, or others who are employed and are no longer attending school.

Making an Attractive Village More Beautiful

CLARINDA, IOWA.—Early in the spring of 1923, members of the Clarinda Community Club became interested in the idea of making their already attractive little community more beautiful. A small committee was chosen from the club's four hundred members to develop a plan. This resulted in the staging of a contest with prizes for the greatest improvements in the appearance of homes and gardens during the summer.

The town was divided into nine districts, each assigned to a committee of the Community Club, whose first duty was to make a canvass of the residents to secure their enrollment in the competition. The announcement of the contest was received with a great deal of enthusiasm, and nearly four hundred residents signified their willingness to participate. Throughout the summer, the homes of the competitors were visited by members of the committees, and each home was graded according to the improvements effected on the house and other buildings, lawns, gardens, etc. At the close of the summer, averages were taken on the gradings, and a first prize of a sterling silver cup and a second prize of $5 were awarded to those in each district having attained the highest grades. The large cup in the center of the accompanying picture was presented to the owner of the home having the highest grade in the entire city. In addition to these prizes offered by the Community Club, the winning home on Stuart Street was awarded a special cup donated by Mrs. C. W. Stuart, for whose husband that street had been named. Mr. and Mrs. Virgil McCreary were the winners of this cup and also of the grand prize for the city.

The contest was so well arranged, and the prizes in each case so manifestly earned, that there seemed to be no dissatisfaction as to the choices made by the judges. Such splendid results were accomplished by the event last year, that the Community Club expects to repeat the plan during the coming spring and summer.

(MRS.) ORA CLAYTOR MOORE.

How a Small City Is Reducing Its Insurance Rates

LAFAYETTE, LA.—Through the combined efforts of the insurance agents of Lafayette and the Chamber of Commerce-Community Service of Lafayette Parish, as our local commercial organization is known, the people of this community will enjoy the benefits of lower fire insurance rates in the very near future. The movement to bring about this rate reduction was started a short time ago when representatives of several local insurance agencies, together with members of a special committee from the Chamber of Commerce, appeared before the Board of Trustees of Lafayette and presented recent data received from the Louisiana Fire Prevention Bureau relative

to the city's standing in the matter of fire protection and prevention. Following this meeting, the Fire Prevention Bureau was asked to arrange for a complete survey of the city, with a view to establishing a new insurance rating.

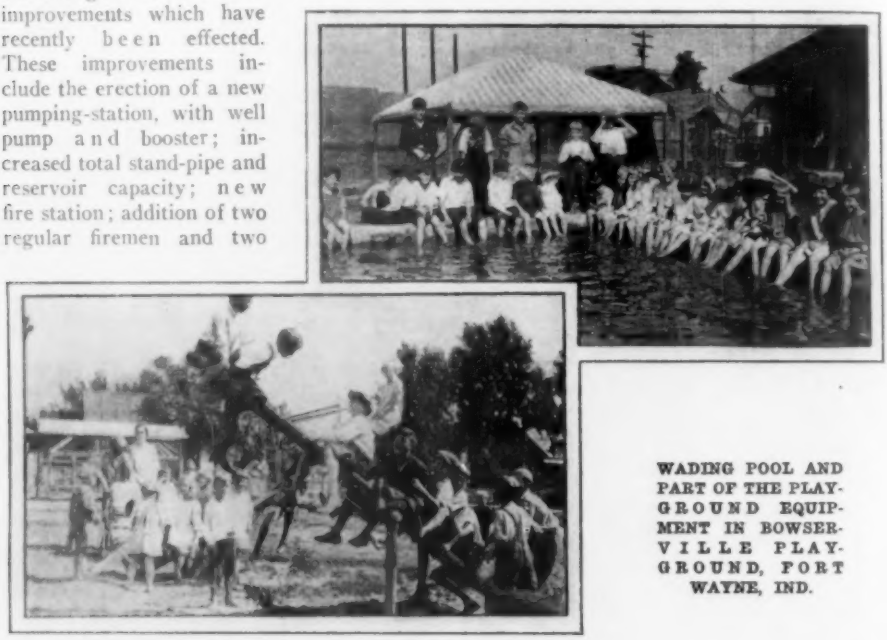
In the inspection which subsequently was made by the Municipal Engineer of the Fire Prevention Bureau, tests were made of the fire plugs, fire-alarm boxes, wells and reservoirs, pumps, fire engines, etc., and a detailed report was submitted to the City Council. In this report it was pointed out that a general reduction in the basic fire insurance rates is now applicable in Lafayette owing to the number of improvements which have recently been effected. These improvements include the erection of a new pumping-station, with well pump and booster; increased total stand-pipe and reservoir capacity; new fire station; addition of two regular firemen and two men for night duty, all on a paid full-time basis; additional hydrants and water-main extensions; and completed construction of all paved and graveled streets. It was further pointed out in the report that by making other specific improvements, a still greater reduction in the insurance rates might be secured.

At a joint meeting of the City Council, Chamber of Commerce and insurance agents, it was decided that the City Council should accept the reduction offered by the State Fire Prevention Bureau, and at a later date, if the additional improvements suggested in the Bureau's report are accomplished, a further reduction will be applied for.

I. T. HART,
Insurance Agent.

A Gift of a Playground

FORT WAYNE, IND.—Through the generosity and public spirit of Mr. and Mrs. S. F. Bowser, their fellow residents and the children of Bowserville have been provided with a permanent park and playground. The site, which covers one-half of a city block, was bought by Mr. and Mrs. Bowser and then deeded to the city of Fort Wayne for public recreation purposes. The playground is well-equipped with swings, slides and other types of apparatus purchased by the city from The Hill-Standard Company, and was opened to the public under the supervision of the Fort Wayne Park Board in July, 1923. A fine wading pool was also installed, which helped to make the playground one of the most attractive and popular resorts for the children of the neighborhood during the past summer.



WADING POOL AND PART OF THE PLAYGROUND EQUIPMENT IN BOWSERVILLE PLAYGROUND, FORT WAYNE, IND.

ADOLPH JAENICKE,
City Park Superintendent and Forester.

The Water-Works of Greenville, Miss., Put on a Paying Basis

By E. M. Foster
Water Superintendent, Greenville, Miss.

IN 1896, when the plant in Greenville was first constructed, the equipment comprised two boilers, two steam-driven air compressors, two ½-million-gallon steam booster pumps and surface reservoirs. The common method at that time for securing water from wells was by the air-lift system. The air compressors pumped the water from the wells to the reservoirs and the booster pumps from the reservoirs to the mains. By 1905, the water demand had increased so rapidly that the plant did not have sufficient capacity, and it was necessary to install a cross - compound air compressor, and a 3 - million - gallon triplex booster pump in the plant.

In 1915 the local power company, on the lookout for new customers, proposed that the city electrify the pumping plant. Their purpose, of course, was to obtain a desirable power load for their electric lines and incidentally effect a saving to the city. A counter proposal, the essence of which was that the power company operate the water plant on a flat rate, was advanced by the city. On this basis a six-year contract was made between the city and the power company.

The first step was to electrify the pumping plant; two motor-driven air compressors and three motor-driven high-speed centrifugal pumps replaced the steam equipment. Steam pressure was maintained in the boilers at all times, however, and the steam units were kept in readiness for use in case of failure of the electrical power.

The new electrically driven equipment was installed to give the very highest efficiency possible, but even with these precautions the power company had anything but a lucrative proposition. By 1920 the operating cost and excess water demand, due to leaks in the mains, and unmetered service, were so high that the water-works proved to be a losing proposition. In 1921, when the contract terminated, the power company refused to renew it; this of course reverted the water-works to the city.

E. M. Foster, then chief engineer of the Delta Light & Traction Company, was employed by the city to take charge of the water-works. He realized that if the power company could not operate the plant at a profit, the city could not do so unless some improvements were made.

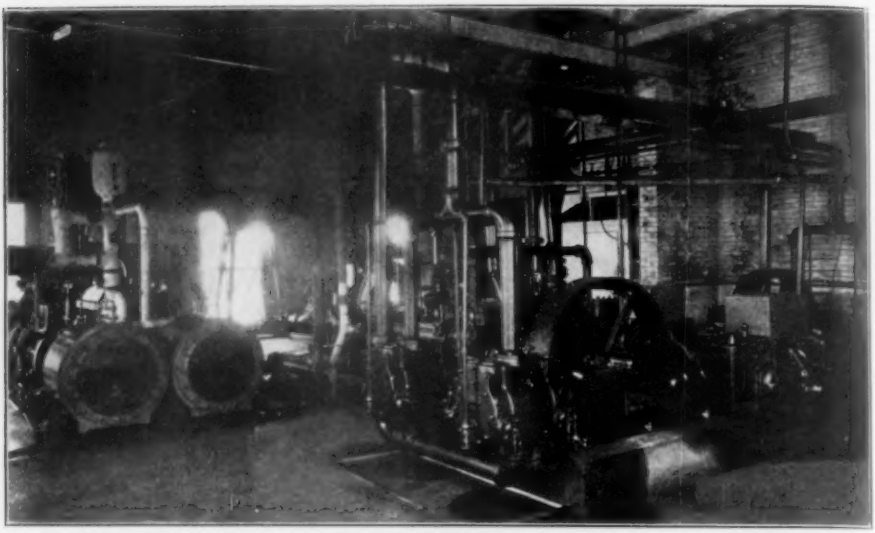
How It Was Done

When Greenville, Miss., assumed municipal control of the water plant on January 1, 1921, the yearly operating cost was approximately $52,000; to-day it is $20,000.

Although there is nothing miraculous about this saving, it does show the result of a careful study of all phases of the water system. The causes of inefficiency were ferreted out and efficient methods were applied soon after the city assumed control. The three remedies which have been responsible for practically the entire saving were: (1) the installation of water-meters; (2) stopping leaks; and (3) the change from the air-lift system to the Layne system using vertical centrifugal pumps.

Checking Water Waste

A Venturi meter which measured the amount of water going into the main was recording, on the average, 3 million gallons a day. It was evident that a town of 11,000 inhabitants and a few industrial plants could not consume this amount. Inspectors were employed whose duty it was to make systematic inspection of the private plumbing, and if a leak were found, the consumer was notified to repair the plumbing, or service would be discontinued; all noticeable leaks in the mains were immediately repaired. In a few months the daily consumption was less than two million gallons. The main pressure, which had been



EQUIPMENT USED IN WATER-WORKS PUMPING-STATION, GREENVILLE, MISS., PRIOR TO 1921

maintained at 60 pounds, was reduced to 50 pounds and later to 40 pounds without complaint from the consumers. This decreased the amount of water pumped to 1,600,000 gallons. The water had always been sold on a flat rate based on the number of fixtures, but the installation of meters, first on the large consumers' taps, and then on the others, has made our present daily requirements approximately 1,150,000 gallons. To date 1,000 meters have been installed. About 45 per cent of the customers are metered; the others are being metered as rapidly as possible and in a short time the consumption will be less than 1,000,000 gallons a day, a reduction of 66 per cent in less than three years.

Reducing Pumping Costs

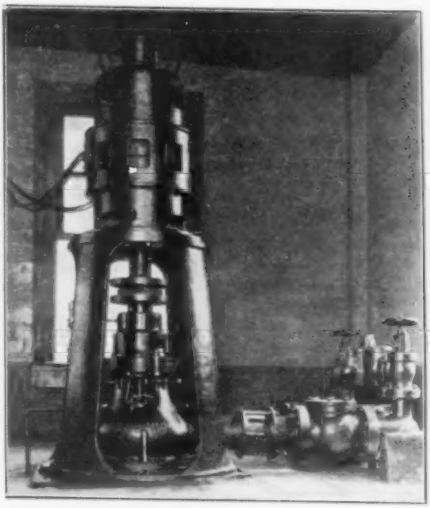
The water required had now been reduced to a minimum, and the next move was to find a more efficient method of pumping the water. The air compressor equipment had been installed and maintained as efficiently as possible, but nevertheless it was a very expensive proposition. Our new investigation included plunger pumps, air-lift, and deep-well centrifugal pumps, and we decided upon the latter, because of the high efficiency and low maintenance cost inherent in equipment of this type. A contract was made with Layne & Bowler Company of Memphis, Tenn., to furnish two high-efficiency pumps and two wells and to guarantee the quantity of water to be delivered; that is, for the price stipulated in the contract, the first unit had to produce 1,200 gallons per minute and the second unit 900 gallons per minute, or the money would be refunded. One unit was installed at the pumping plant, and the second unit in the approximate center of the water distribution system. The official test showed 1,500 gallons per minute and 1,200 gallons per minute respectively. These units pumped directly from the wells to the mains against 40 pounds pressure; in other words, the two operations of pumping from the wells to the reservoirs and then to the mains were combined into one. One pump, housed in a frame structure, now does the same work formerly done by the extensive earlier equipment.

The motor frame supporting the vertical 100-h.p., 870-r.p.m. Westinghouse motor rests on a concrete foundation, and the pump impellers and stages are set 80 feet below in the wells. A vertical shaft enclosed in an oil tubing connects the impellers and the motor. The wells were drilled to a depth of 525 feet. To accommodate the pump, a 24-inch hole extended down 82 feet; beyond this the hole is 10 inches in diameter with a special wire wrapped screen placed opposite the water-bearing formation. Before a screen of a definite opening was decided upon, the sample of sand was

analyzed to determine the correct screen size, sufficiently small to restrain the sand but large enough to admit the water freely. This screen is made by winding keystone shaped wire on a perforated iron pipe so that the smaller width of the wire is wound next to the pipe. The pipe gives strength to the screen and does not allow it to be distorted by external pressure. The openings on the outer circumference of the screen are considerably smaller than the openings on the inside, so that the sand does not clog the screen; any sand that passes through the outside will go immediately into the well and not impede the flow of water.

The new equipment was put into service in July, 1921. An immediate result was shown in our power bill: in June, 1921, the electrical consumption was 74,010 kw. hrs. and in September, 1921, 53,820 kw. hrs.

The Layne pumps had been designed to pump 1,300 gallons per minute against a 50-pound pressure, and at that rating had an efficiency of 70 per cent, but as the water demand decreased, a gate-valve was necessary to throttle the discharge and keep a 40-pound pressure at the mains. A hand gate-valve proved very unsatisfactory, and an automatic regulating valve was installed between the pump discharge and the main, which maintained a 40-pound pressure at all times, regardless of the pump pressure. The pump pressure was always 20 to 60 pounds higher than the main pressure. To increase the efficiency of the installation, one of the stages of the vertical pump was removed. While this was being done the water system was operated for six days by air. In the six days of air pumping, the kw. hr. consumption of the air-lift was 12,820. The following six days the meter readings on the Layne system showed 7,994 kw. hrs., or a saving in six days of 4,826 kw. hrs. From this test the comparative data on page 270 have been prepared, based on a power cost of 2½ cents per kw. hr.



VERTICAL DEEP-WELL PUMP AT GREENVILLE

LAYNE PUMP-HOUSE AND AUTOMATIC REGULATING VALVE, GREENVILLE

The estimated saving in one year, that is, $7,250, would be the interest on an investment of $120,500 at 6 per cent. The repairs since 1921 on the Layne unit have been practically negligible. New packing is put in about every 90 days, and this is really the only expense connected with the equipment.

The Greenville water-

works to-day is in a better condition than ever before; the building and yard—a deplorable spectacle a few years ago—are now very presentable; the water consumption is now 1,150,000 gallons per day, and the pumping cost has been reduced approximately 50 per cent.

	Daily Kw. Hr.	Gallons per Day	Kw. per 1,000 Gal.	Cost per 1,000 Gal.	Yearly Cost
Air-lift	2,137	1,150,000	1.86	4.18	$17,600
Layne system	1,332	1,150,000	1.10	2.47	10,350
					*$7,250

* Yearly saving.

When the two units were first installed, it was necessary to operate both of them at times in order to supply the water demand. Since the requirements have been decreased, only one centrifugal unit is used and the other is held in reserve. We believe that by the installation of an elevated tank which we are contemplating, for the future we can reduce our power consumption another 25 per cent, as the one well that we use regularly will give enough water at full capacity in thirteen hours to supply our city for twenty-four hours.

Madison's Streets Cost $418,114 in 1923

By E. E. Parker
City Engineer, Madison, Wis.

STREET improvements made in Madison, Wis., during 1923, aggregating $418,114.36, were accepted by the Common Council during 1923. Contracts awarded for new street pavements for 1923 represented a total cost of $392,421.12. A number of streets were not completed, but several pavements for which contracts were awarded in 1922 were accepted during 1923. Of the streets accepted, the cost was divided as follows: city's share, $118,606.52; property owners' share, $284,623.81; Madison Street Railway Company's share, $14,387.03; Chicago and Northwestern Railway Company's share, $497.

During 1923, 6.26 miles of pavement were laid, bringing the total number of miles of improved streets up to 89.4. Various kinds of pavements and the number of miles of each are: plain macadam, 33.42; tar-filled macadam (penetration), 1.53; Tarvia concrete (Topeka mix), 0.01; asphalt-filled macadam (penetration), 6.80; asphalt-mixed macadam, 5.06; asphaltic concrete, 2.63; sheet asphalt, 19.31; brick, 1.56; sandstone block, 0.10; cresoted wood block, 2.90; concrete (reinforced), 15.18.

During the year 1.15 miles of sheet asphalt paving was laid, 1.47 miles of wood block and 3.64 miles of concrete.

The Cost of Maintaining Sewers

IN 1922 the Bureau of Sewers of Chicago, Ill., spent $365,733.31 for cleaning sewers, $118,039.59 for repairing sewers, $64,353.29 for inspection, $36,067.39 for office and miscellaneous expenses, and $27,501 for the replacement of three Auto Eductors. There are now in service in Chicago 760.79 miles of brick and concrete sewers, 1,868.81 miles of tile pipe sewers, 132,088 catch-basins, 98,372 manholes, and 421,086 house drains, a system which represents a total cost of $44,553,376.11 for sewers and auxiliary equipment.

For flushing 8,486,300 lineal feet of sewers the cost was $59,598.28, or 70 cents per 100 feet. The cost for cleaning by scraping a total 747,500 lineal feet of sewers was $90,538.58, or $12.10 per 100 feet.

Hand cleaning of 19,860 catch-basins cost $70,945.32, or $3.58 per catch-basin. For cleaning 29,092 catch-basins with Auto Eductor machines, the cost was $63,729.17, or $2.19 per catch-basin.

Facts Regarding the Municipal Power-Plant at Pasadena, Calif.

THE electrical utilities of the city of Pasadena, Calif., showed a gross income of $823,803.95 for the fiscal year ended June 30, 1923, which was an increase of 18.09 per cent over the previous year. The output in kilowatt-hours sold increased 6.9 per cent. After paying all operating expenses, including depreciation and charging interest on the total average investment, there was carried to surplus for the year $204,675.37, making the total amount carried to surplus to date for this utility, $890,925.56. The investment per dollar gross receipts during the past year was $1.77, as compared with approximately $5 or more for well-managed privately owned electric light and power utilities. The income per capita was $14.03, which is a very good showing indeed considering the low rates charged by the city. The rate charged by this utility for light ranges from 5 cents to 3 cents per kilowatt-hour and for power from 4 cents to 1½ cents per kilowatt-hour.

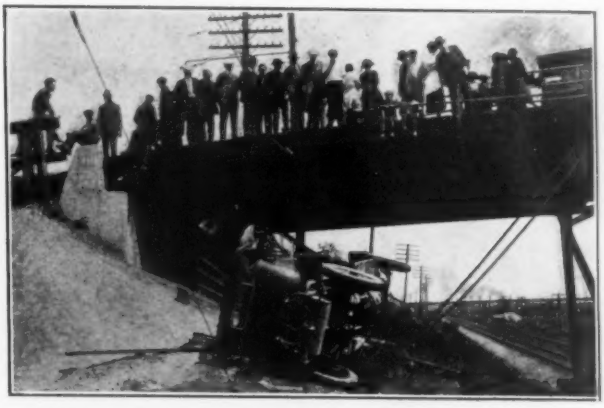
Outstanding Problems in Highway Bridge Design---Part II

By E. F. Kelley

Senior Highway Bridge Engineer, U. S. Bureau of Public Roads

Bridge Floors

FLOORS of concrete bridges will, of course, be of concrete. Floors for steel bridges may be of either wood or concrete. The determination of which material shall be used depends upon first cost and maintenance charges. The use of a wood floor will usually result in a somewhat lower first cost, both in the floor itself and, because of its low weight, in the supporting structure. But the maintenance cost is high, both on account of decay and on account of traffic wear. Decay may be partially overcome by preservative treatment, and protection from the wear of traffic may be afforded by some sort of wearing surface. Both preservative treatment and wearing surface are expensive and tend to eliminate much of the apparent advantage in first cost.



ACCIDENTS LIKE THIS ARE OF TOO COMMON OCCURRENCE
A right-angle turn in the bridge approach and a flimsy rail contributed to this accident

We have many thousands of wood-floored steel bridges which are still serviceable but which are too light to carry anything but the wood floors for which they were designed. Increased traffic has made the maintenance of these floors very expensive and they must be maintained if the bridges are to be continued in service. A very satisfactory method of handling this maintenance problem is the use of laminated or strip floors of 2 by 4's or 2 by 6's laid on edge and spiked together, and protected from wear by a carpet coat of tar or asphalt mixed with gravel or stone chips. This provides a serviceable floor and one which increases the rigidity of light structures. But this situation should be avoided in future construction by making fixed steel bridges capable of carrying a concrete floor, even though it is intended to construct them in the first place with wood floors.

Wearing Surfaces

The bridge floor has two distinct functions to perform—it must be capable of carrying traffic loads and of resisting traffic wear. It is not desirable to subject to wear that portion of the floor upon which we depend for structural strength and, therefore, concrete bridge floors should be protected by a wearing surface or pavement. It will then be necessary to construct the floor only once—when the bridge is built. The pavement, which is subject to the destructive effect of traffic, can be maintained and renewed as required.

Concrete wearing surfaces for bridge floors are of two types—those placed monolithically with the concrete sub-floor, and those placed separately. The separately placed wearing surfaces are to be preferred, since they furnish a definite line of demarcation between the wearing surface and the sub-floor and thus provide effectively for maintenance and renewal.

In general, it is desirable that the bridge pavement be of the same type as the pavement of the adjacent highway. Of the

A TYPICAL STEEL COUNTRY HIGHWAY BRIDGE

This bridge of the old type with its dangerous unprotected approach and trusses which are exposed to possible injury by vehicles, should be replaced by a structure more in accordance with the safety of traffic

wearing surfaces other than concrete, brick and asphaltic concrete find their greatest use when the highway paving is of one of these materials. Asphalt blocks are well suited for floors upon which an asphalt surface is desired but where the size of the job is not sufficient to warrant the purchase or use of even a moderate-sized paving plant.

In case a bridge is located on an unpaved road upon which traffic is not sufficiently heavy at the time of construction to make a wearing surface of immediate necessity, the pavement may be omitted temporarily and placed later, when needed for protection or when the highway is paved. In the latter case it may be included in the regular paving program. In all such cases it is desirable that some additional thickness of floor be provided as a temporary monolithic wearing surface and it is essential that provision be made in design for the weight of the future pavement. The proper allowance to be made for the weight of future paving will depend, of course, on the type which is anticipated. It should never be less than 25 pounds per square foot, which will permit the use of a 2-inch bituminous surfacing, and if concrete or brick is to be used it should be at least 50 pounds per square foot.

For bridge pavements the requirements governing quality of materials, care in construction and curing, and accuracy of finish should be, in all respects, at least equal to the corresponding requirements for the highway pavement, of which the bridge floor is virtually a part.

Junction of Bridge with Highway

Theoretically, the junction of the bridge floor with the adjacent highway should be smooth and even and should have as good riding qualities as any other portion of the road. Actually, this condition is difficult of attainment because of the settlement of approach fills and the necessity of providing expansion joints at the ends of structures. The design of expansion joints which will perform their function without introducing objectionable features in the roadway surface is a difficult matter. Innumerable types of joints have been used, but the ideal joint is yet to be devised.

The settlement of approach fills introduces a complication which is particularly difficult to overcome on unsurfaced roads or those surfaced with a non-rigid type of pavement. In these cases only the most careful maintenance will prevent objectionable and dangerous humps at the ends of bridge structures. When the highway paving is of concrete, the difficulty has been overcome in many instances by bridging, with the pavement itself, that portion of the fill adjacent to the structure. The end of the pavement is supported on the abutment back-wall and is reinforced to act as a slab for a distance of from 10 to 20 feet from the abutment. If appreciable settlement does occur when this construction is used, it will not result in a dangerous hump.

In some instances, serious damage has been done to bridge structures by the creeping of concrete pavements. When this action takes place, there are introduced forces of greater magnitude than any bridge can be expected to withstand. To provide for this condition, diagonal expansion joints have been placed in pavements near bridges, with the idea that any longitudinal movement of the pavement will force it to move transversely along these joints and thus prevent the enormous pressure from being transferred to the bridge. I do not know that any such installations have been in place long enough to demonstrate their effectiveness.

Protection of Structures and Traffic

Before the advent of high-speed motor traffic it was considered sufficient to provide for the safety of vehicles on structures. Now we must not only make this provision but must also protect our structures, particularly our truss spans, from traffic accidents.

It is only recently that the need for this protection has become apparent, but now our bridges are being wrecked in ever-increasing numbers, with consequent loss of life and property. Trusses are the most vulnerable and have been the chief victims of these accidents. Their adequate protection from injury or total destruction is a new problem for highway bridge engineers, and a most important one.

The accidents which have occurred indicate that the structure must be afforded protection for its entire length, since spans have been wrecked by collisions with web members as well as with end posts. Two methods have been suggested as a means of affording this protection. The first of these is the use of skid beams such as are used on railway bridges; the second is the construction of curbs high enough to stop a truck. Both methods have their disadvantages. One is that neither is very well adapted to use on existing structures. Another is that both will probably detract from the appearance of the structure.

The bridge is an integral part of the highway. It must be capable of carrying the loads to which it may be subjected; it should restrict traffic as little as possible; its floor should have as good riding qualities as any other portion of the highway; it must afford safety to traffic and must itself be protected from accident.

The two principal requisites of any protection which may be furnished are, that it shall be supported independently of the truss members which it is to protect, and that it shall be strong enough to stop a motor vehicle.

Of the two methods which have been suggested, it seems that protection by curbs offers the greater possibility of satisfactory development. But it is scarcely applicable to bridges not floored with concrete and can probably have little use on existing structures, since it will usually result in a narrowing of the roadway unless provision for this detail has been made in the original design. The curb should be at least 15 inches and preferably should be not less than 18 inches high. Its inside face should be at least 12 inches from the clearance line of the truss members. By flaring these curbs at the ends of the structure and extending them out onto the approach fill or pavement, the end posts may be protected from vehicles approaching the bridge.

In the case of existing structures, when it is not feasible to protect the web system, the ends of the bridge may be protected from approaching vehicles by massive masonry posts.

In addition to affording positive mechanical protection, any device which may serve to direct traffic and to clearly define the roadway and the traffic lanes will be of benefit. Marking traffic lanes by painted lines on the roadway surface and painting railings a light color are effective.

From the humanitarian standpoint, the protection of traffic is more important than the protection of structures, and we have altogether too many serious accidents due to the lack of this protection. Traffic protection is not so simple as it was in the days of light vehicles and low speeds, and it is necessary to provide more adequate safeguards than have been furnished in the past. The protection of the bridge approach has already been mentioned. On truss bridges any adequate protection of the structure itself will safeguard traffic. On other bridges, particularly those of the deck type, substantial curbs and rails are necessary. Flimsy rails, which will not withstand great punishment before failure have no place on modern bridges.

ACKNOWLEDGMENT.—From a paper read before the American Road Builders' Association, Chicago, January, 1924.

A Fly-Rhyme for Fly-Time

The time is nigh to swat the fly;
This annual pest gives none a rest;
Soak him early, soak him late—
That's what health officials state.

—New York Evening Post.

A STREET THAT WAS LITERALLLY PULLED OUT OF THE MUD

South Chestnut Street, Clarksburg, W. Va., before and after improvement with reinforced concrete paving and curb

Modernizing a West Virginia City

By Charles F. Mebus

Albright and Mebus, Consulting Engineers, Philadelphia, Pa.

CLARKSBURG, W. Va., the county-seat of Harrison County, lies on the watersheds of the West Fork River and Elk Creek. The former runs from south to north, and the latter meanders through the city from east to west in a serpentine fashion to such an extent that the main street, running also from east to west, crosses the creek four times. There are twelve street bridges within the city limits—two over the West Fork and ten over Elk Creek. The city is built on more than the proverbial "seven hills," and street grades run as high as 23 per cent.

The old city grew between the railroad and the hills to the south, and four additional villages grew to the east, north, west, and southwest, all of which were consolidated in 1917 into one city of about 30,000 population. At the same time a new scheme of city government was effected, namely a city commission consisting of the mayor and two commissioners. At the time of the consolidation most of the street improvements in the old city had outlived their usefulness, and public agitation for improvements resulted in a vote in 1919 authorizing a $900,000 bond issue—$300,000 for water, $75,000 for fire protection, $525,000 for bridges, sewers and paving. The terms of the bond issue provided that the program for city improvements and expenditure of funds should be made by a joint committee composed of the city commissioners and four citizens—the presidents of the four leading banks, later known as the "Bankers' Committee."

The first thing that engaged the attention of the joint committee was the selection of an engineering organization to plan and supervise the improvements. Owing to the fact that the City Engineer had but a small force and that the contemplated improvements involved radical changes in lines and grades of streets and approaches to bridges, which might subject a local man to much criticism and possible charges of favoritism by those adversely affected, it was thought best to engage an outside engineer with a separate organization to take charge of design and construction, working directly under the joint committee and in conjunction with the City Engineer. The committee engaged Charles F. Mebus for a period of three years as consulting engineer to direct the improvements; and inasmuch as the program originally outlined, together with many subsequent additions, could not be completed within three years, the same arrangement has by mutual consent of the city and the consulting engineer been continued into the fifth year.

Bridges

Five old steel bridges with plank floors were replaced by modern reinforced concrete structures. Three of these were on main streets, and of such a width as to allow but one vehicle and one street car to pass each other. All these were rebuilt at a higher elevation, with cartways as wide as those of the streets going over the bridges, with ample sidewalks on each side and with new approaches. The paving of

the cartways was the same as on the street approaches. Altogether, more than $260,000 has been spent on bridges and new approaches.

Sewers

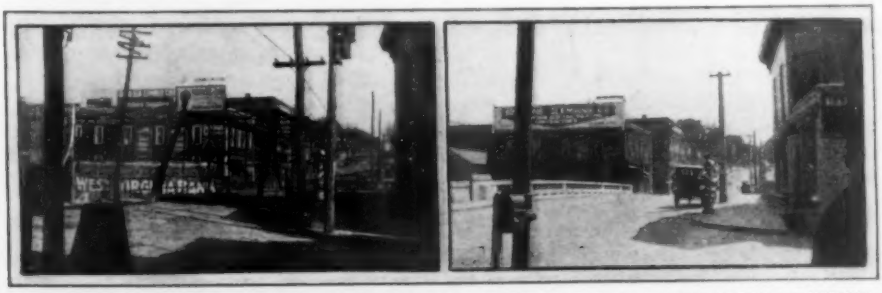
Like most cities in the United States, Clarksburg just grew. In the absence of state regulations, house drainage was conducted to the nearest watercourse in vitrified pipes, which were laid from time to time by property owners and by the city rather indiscriminately along the streets or through private property, as was found most convenient, or along lines that would require the smallest outlay of money. Surface water drainage was attempted in but few cases. In advance of street paving, which was so badly needed, it was necessary to plan and construct surface water sewers, and to revamp the sanitary sewer system; in fact, this system was practically reconstructed through the business section, as the new business buildings required sewers of larger sizes and laid at greater depths than those laid heretofore. Although the older sewers were seldom laid on the separate plan, the new sewers were so planned, when connected with old ones, that ultimately a separation of roof and surface water from house sewage can be made. The two gas companies also laid as a rule new lines and house connections. The Water Board did the same. and the Street Railway Company laid entirely new tracks on steel ties imbedded in a concrete base. All this work retarded the paving program, kept the streets torn up for a long time, and inconvenienced adjoining property owners and the people generally, but nearly all were more or less patient. Sewers were laid of vitrified pipe for sizes 24-inch and under, for over 24 inches in diameter, of vitrified segment block in concrete cradle. A large part of the smaller sizes were also laid in cradle.

Paving

New curbing, often to new lines and grades, was laid in advance of paving. All curbing was of concrete 1:2:4 mixture, 8 inches on top, 10 inches at base, 20 inches deep, and with galvanized curb bars on the outside edge through the business section. Plain curbing was laid through residence sections, sizes 6 inches top, 8 inches base, 10 inches deep. At street intersections, to facilitate the movement of motor traffic, curbing was laid with large radii, 10 to 15 feet and over, as circumstances would permit.

Street paving was laid of two kinds—vitrified shale brick and reinforced concrete. Vertical fiber brick, 3 inches in thickness, was used on all bricked streets, except on grades above 8 per cent, where Hillside block was used, which also was 3 inches in thickness. The base for all brick paving was of concrete 1:2½:5 mixture, 6 inches in thickness, except over deep and wide trenches, where it was laid 8 inches in thickness. On top of the concrete a "dry cement sand" cushion, 1 inch in thickness, was spread, and the brick laid on it. Asphalt filler was used on all streets, except on a few steep hills, and has been found most satisfactory. Asphalt-filled joints allow the street to be opened to traffic at once and prevent cracks from forming in the brick paving. Repairs can be more easily made with asphalt-filled joints than with cement joints.

Concrete street paving was done only in minor residence streets where low cost was essential, as the cost of all the street pav-



ANOTHER BRIDGE ON MAIN STREET, SHOWING WIDENING OF THE STREET MADE POSSIBLE BY THE REMOVAL OF THE STEEL STRUCTURE

LOOKING WEST ON MAIN STREET, CLARKSBURG, W. VA., BEFORE AND AFTER THE REMOVAL OF THE BRIDGE OVER ELK CREEK, AND SHOWING THE NEW BRICK PAVING

ing and most of the sewer construction was assessed on the front-foot basis on the adjoining properties. The paving mixture was 1:2:3, thickness 6 inches at side, 8 inches at center; 56-pound galvanized iron mesh was used for reinforcing, and joints were filled with bituminous filler. On some grades above 17 per cent the surface was finished with grooves running partly across the driven part of the cartway.

Extent of Improvements

In the four years the following amount of work was done:

	Miles
8-inch vitrified pipe sewer laid	1.8
10-inch vitrified pipe sewer laid	0.8
12-inch vitrified pipe sewer laid	1.1
15-inch vitrified pipe sewer laid	0.4
18-inch vitrified pipe sewer laid	0.6
20-inch vitrified pipe sewer laid	0.3
24-inch vitrified pipe sewer laid	0.5
30-inch vitrified segment block laid	0.1
33-inch vitrified segment block laid	0.2
42-inch vitrified segment block laid	0.1
Total	5.9
Sewer manholes built	142
Sewer inlets built	137
	Miles
6-inch concrete curbing laid	11.4
8-inch concrete curbing laid	1.7
	Sq. Yd.
Brick paving laid	53,700
Reinforced concrete paving	45,500
Houses moved back to widen or relocate streets	3
Floors of stores raised	2

The total cost of improvements made for four years was about $1,100,000.

Traffic Regulations

An agreement was effected with the street railway company to lay additional tracks between the two main streets running east and west, in order to make it possible to establish one-way streets in the business section, which had heretofore been greatly congested. The Police Department, after the main streets were paved, adopted the one-way traffic regulations, which have greatly facilitated the movement of motors through the business section, and through this regulation additional space for parking has also been provided.

Changes in Business Section

The business section of the city was also much improved by removing all trees from sidewalks and all awnings supported by posts on the curb line. A number of the merchants substituted marquees over store entrances. All wooden poles carrying trolley, telephone and light wires were removed and replaced by iron poles carrying wires on top and having ornamental brackets for street lights on the side. Many owners relaid the sidewalks in front of their properties, thus making an entirely new street between property lines.

In promoting these changes the city authorities were well supported by the Chamber of Commerce and other local civic associations, as well as by the public utilities companies. On the whole, most excellent team-work was secured from all parties concerned.

Financing

The total fund provided by the bond issue was but $525,000, of which about $250,000 was required for bridge construction and $165,000 for sewer construction the first year. It was intended to use the balance as a "revolving fund," that is, to allow the bond issue to run, and apply payments received from assessments to new paving over and over again until the paving program was completed. During the second year, however, the Attorney General ruled that all money received from property owners for assessments must go into the sinking fund for redeeming the bond issue. The State

Legislature in 1921 granted the city a new and up-to-date charter by which the city was authorized to carry out the street paving and sewer program with funds obtained from front-foot assesments.

Council-Manager Government

The new charter also changed the form of city government from city commissioners, as above noted, to council-city manager. Clarksburg was fortunate under the new charter to obtain the services of a city manager who had had experience in other cities. The powers granted by the new charter and the progressiveness of the Council and City Manager enabled the city to go on with its program for improvements without interruption. Altogether, over $1,100,000 worth of work has been done in the last four years, and the city's indebtedness has been reduced at the same time.

The progressive spirit of the citizens may be judged from the fact that when it was learned that about $60,000 was necessary to build approaches to the proposed new crossing under the main line of the Baltimore & Ohio Railroad on the line of the old Northwestern Pike, an amount which could not be obtained from assessments on adjoining property, an extra tax levy of one mill was promptly authorized by a popular vote. This work is now in progress and will be paid for in cash. Again, since the people saw the improvements in the center of the city, numerous petitions have been filed with the City Council for paving streets and laying sewers in the residence section entirely at the expense of the adjoining properties.

What has been done here merely goes to show that the American people can have almost anything in the way of municipal service and improvements for which they are willing to pay; and, conversely, that the American people are very likely to be willing to pay for almost any needed and worthwhile municipal improvement, provided it is intelligently planned and honestly installed.

H. G. Otis is the City Manager, Thomas Lang, the City Engineer; E. R. Patterson was from January, 1920, to May, 1923, the resident engineer, and Thomas W. Sparrow since May, 1923, has been the resident engineer for Charles F. Mebus, consulting engineer.

Notable Improvements in Street Lighting in 1923

THE year 1923 was notable in many respects in the annals of street lighting. Traffic has continued to multiply so rapidly that the present systems of lighting thoroughfares in most cases are inadequate, and in an effort to correct this condition and relieve night congestion of traffic, many cities have realized the necessity of revamping their entire street-lighting systems.

Prominent among these are St. Louis, where $8,000,000 was voted for street lighting, and where in the next five years at least 45,000 ornamental lighting standards will be installed. The District of Columbia is considering the installation of a complete new system involving between 20,000 and 30,000 new ornamental units at an expense of over $4,000,000 to the central station and to the district. The city of Columbus is experimenting with various types of new street-lighting systems before applying for a bond issue to replace the present equipment.

These are the most prominent examples of the larger cities that are considering the wholesale replacement of present street-lighting facilities, but there are numerous other cases where similar improvements are under way, including the creation of special lighting districts and the extension and strengthening of existing systems. According to the *General Electric Review*, in all these cities there was a noticeable trend toward high-intensity lighting in the business districts. The effect of such systems on the character of modern street lighting is readily shown by the increase in the light intensity on some of the recently equipped streets, included in the accompanying table:

INCREASES IN INTENSITY OF ILLUMINATION AS COMPARED WITH SUPERSEDED SYSTEMS

Market Street, Lynn	18 times
Broadway, Saratoga	15 times
Market Street, San Francisco	15 times
Triangle District, San Francisco	12 times
South State Street, Chicago	11 times
Main Street, State Street and Broadway, Salt Lake City	8 times
Broadway, Los Angeles	6 times

In addition to ornamental high-intensity systems for business districts, there is a definite trend toward ornamental lighting of high intensity in other parts of the city. In Syracuse, N. Y., for instance, where the business district will be lighted by ornamental arc lamps, the entire residential district will be lighted by lanterns on ornamental standards.

Most of these cities are planning their new systems in a comprehensive and intelligent way. They are first analysing their requirements, not only for the present, but over a period of years. Lansing, Mich., for example, determined upon a lighting plan, and selected lighting units and ornamental standards of various sizes and intensity for different parts of the city, but all with the same architectural features. Some of the principal thoroughfares in residential districts have already received this treatment, and probably during 1924 the business district will be intensively lighted. Even if it requires a number of years to complete the program, there is always the assurance that there will be complete symmetry and harmony from an architectural and illuminating standpoint among all districts of the city.

For several years there has existed a demand for a relay that could be connected into a series circuit to operate a switch in a multiple circuit, so that incandescent lamps on multiple circuits could be turned on and off in unison with the starting up and shutting off of an arc lamp circuit. A device developed to meet these conditions has been placed on the market, consisting of a coil that is connected into the series circuit, while inside the coil is an armature which will open and close a mercury switch located below, as the current goes on and off. The mercury switch is connected on one side of the multiple circuit, so that it opens and closes this circuit when the mercury is tipped from one side of the tube to the other. The series coil is supported by a large porcelain insulator, and the multiple circuit is kept a sufficient distance from the series circuit so that there is no danger of its coming in contact with it. The only connection between these two circuits is an insulating rod which tips the tube from one position to the other. This tube is large enough to carry 25 amperes on a 110-volt circuit, or 15 amperes on a 220-volt circuit.

A special fixture was designed for hanging over the intersections of streets so as to illuminate the traffic officer. It is provided with a glass reflector that has been copper- and silver-plated and is shaped so as to produce a concentrated beam of light equivalent to 5,500 candle-power. Under normal conditions the traffic officer is rendered visible in strong relief for distances up to 1,500 feet.

The adequate lighting of highways, which was first rendered practicable in 1921, has been greatly extended, and at the close of 1923 between 400 and 500 miles of road had been provided with this system of illumination.

Aid Available for Local Art Movements

THE AMERICAN FEDERATION OF ARTS, of Washington, D. C., the national body uniting all the principal art museums and art societies of this country, is extending its membership in some eighty-five cities by the formation of local chapters. These chapters enable the people locally interested in art to link themselves up with the national headquarters for art activities, and both receive and furnish in part the support of the most influential organization of its kind. The chapters frequently take the initiative in local art movements and, in some instances, have been instrumental in the establishment of permanent art museums.

Local chapters have many advantages. Federation members are entitled to free admission to all the leading museums of this country; the chapter receives special consideration when it desires to bring to its city one of the fifty loan exhibits of the Federation, etc. There are half a million dollars' worth of these exhibits, consisting of paintings, etchings, sculpture, and industrial art, obtained from the Metropolitan Museum in New York, the National Academy of Design, etc., and from the artists direct.

Individual members of these chapters may receive small collections of prints and etchings for leisurely examination and display in their homes, selection and purchase, and receive a discount on such purchases. All members are also entitled to receive without charge the *American Magazine of Art*, a lay publication presenting the newest developments in contemporary art.

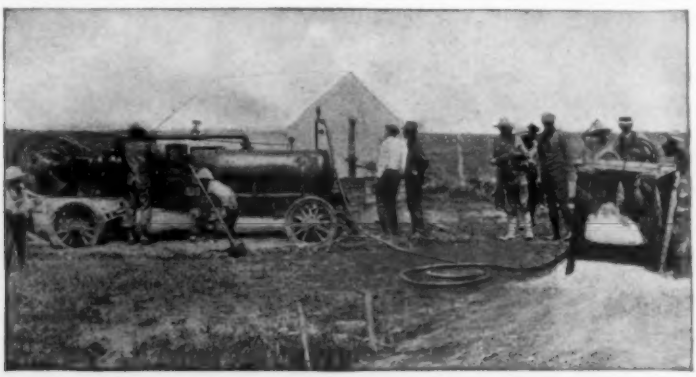
A PANORAMIC VIEW OF ARTESIAN PARK, SHOWING A PORTION OF THE WELLS

Improvements in the Water-Supply of Ogden City, Utah

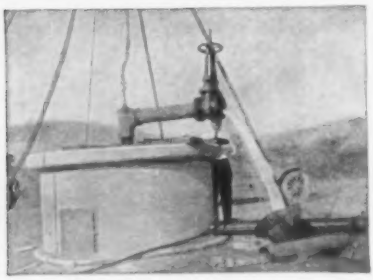
By B. B. Brewster

THE constantly increasing demand for water in Ogden City, Utah, led Mayor Francis, the City Commissioner and the City Engineer, in 1920, to investigate ways and means for increasing the supply. At that time, L. M. Winsor, of the Department of the Interior, and the writer were testing a number of wells in the state with a portable outfit mounted on a truck. This outfit consisted of a Sullivan belt-driven compressor, a gas engine, an air receiver and other necessary equipment. Arrangements were made to test a number of the city wells, to determine their capacities.

The supply for Ogden City is secured from a number of artesian flowing wells at Artesian Park, located at the head of Ogden Canyon, about 10 miles northeast of the city. The source of the supply is a water-bearing gravel stratum, lying approximately 150 feet below the surface. At the head of the canyon this water-bearing stratum meets an impervious formation standing in a tilted position, which helps to form a natural catch-basin for the water originating in the surrounding mountains. The water filters its way through the various formations to the gravel watercourse. This condition gives a natural flow of water of a somewhat limited capacity, which has been collected and carried to the city for years, forming the entire city supply, but was not able to meet the growing demand. There are 34 wells in this basin, 18 with 6-inch casing, and 16 with 4-inch casing,



PORTABLE OUTFIT USED BY THE DEPARTMENT OF THE INTERIOR FOR TESTING WELLS



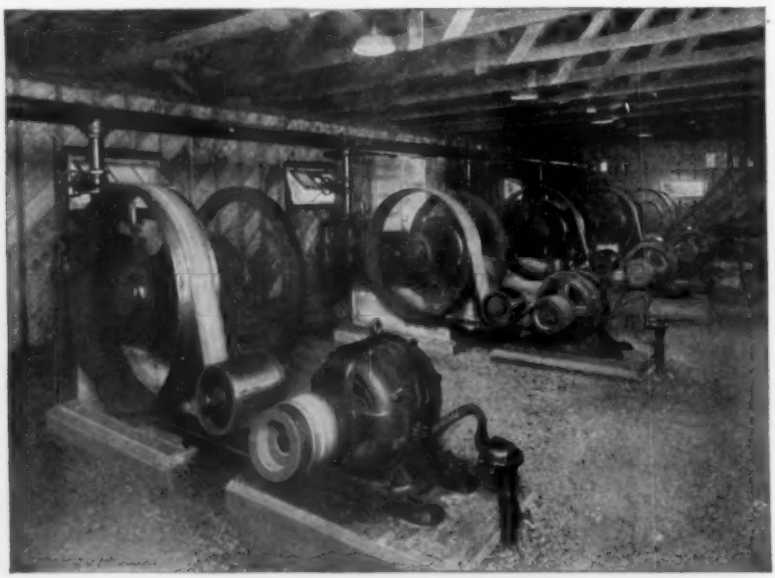
NATURAL FLOW

BACK-BLOWING

ranging from 120 to 200 feet in depth. In testing a number of these wells, an air-line was lowered through a tee, and a valve was located on the discharge. The air reducing the weight of the discharge column increased the flow, and the valve upon the discharge was used to back-blow and clean out the sand and gravel adjacent to the bore holes.

This work showed that the stratum was unusually plentiful and that constant pumping within reasonable limits would in no way diminish the supply.

In the spring of 1922, W. S. Craven, City Engineer, decided that the air-lift system would be best suited for the pumping of the flowing wells to increase their capacity, as it would be possible to install a central plant with multiple units to pump all or any group of wells. Furthermore, during the part of the year that the natural flow of the wells was sufficient to furnish the supply, the air-lift installation would not interfere with the flow. Inasmuch as there are no moving parts outside the power-house, the system was always ready for operation, even after long shut-downs. By the use of this system, any one of the wells can be back-blown and cleaned while the others are in operation. If by continuous pumping the water head at any time should be lowered, it would be only neces-



FIVE COMPRESSORS USED TO FURNISH AIR FOR THE AIR-LIFT PUMPS AT ARTESIAN PARK, OGDEN, UTAH

sary to lower the air pipes in the wells to restore the original efficiency.

In 1922, eight 6-inch wells were equipped with Sullivan air-lift pumps, including two single-stage air compressors with 50-horsepower Westinghouse motors. The two compressors were installed to more economically meet the varying demands. The results obtained in 1922 were so highly satisfactory that in 1923 three more compressors, a booster and 28 well equipments were installed, giving a very flexible plant capable of taking care of any demand from minimum to maximum.

The booster is used for compressor cooling water and lawn sprinkling. During 1923, 26 wells, 17 of which are shown in one of the illustrations on page 279, were equipped with cement collector basins, from which the water flows by gravity or may be pumped during high demand.

It is interesting to note that air-lift pumping has increased rather than decreased the water-supply, by opening up the water-courses in the gravel beds. This is shown by the fact that the "draw down" in static head is 3 feet less than it was when the wells were first tested.

Unique Method of Repairing Large Water-Mains

A UNIQUE feat was recently accomplished in Baltimore when a cracked 48-inch water-main was welded without disturbing its position in the ground. According to the report of V. Bernard Siems, Water Engineer of the Baltimore Water Department, a leak on North Avenue at Oakhill Avenue was found to be caused by a straight latitudinal crack on the upper side of a 48-inch pipe and extending almost half-way around it.

It was estimated that the usual method of removing and repairing the damaged section of the pipe would have cost $1,040, and on account of the size of the pipe, the section of which weighed roughly 9,000 pounds, the work would have consumed considerable time, during which the water-main—in this particular case an important Low Service Zone supply line—would have remained out of service. To expedite the repair work as well as to save costly materials, the crack was welded by the Electric Welding Company of America under the direction of the manager, A. Rhodes Knight, who has developed a process by which cracks in cast iron pipe can be welded while the damaged section remains in position.

The choice of materials used in the process is the result of much experimental work and has made possible a weld which hitherto was generally believed to be impractical. The welding machinery used was mounted on an automobile truck and generated its own electricity. The only preparatory work necessary was to expose the main and to drain the water in the pipe below the limits of the crack. The entire operation required but a few hours and cost but $304.92, the cost of welding alone being $100. Inspection of the repaired section of the main when again in service showed the weld to be water-tight. The success of this method of emergency repair work is also notable in that a saving of $735.08 was effected, and is illustrative of efficient and progressive water-works practice.

Building a Veneer Surface for North Carolina Roads

AN important application of research work by the North Carolina Highway Commission is the construction of stone veneer on earth roads. In the South there is an exceptionally large mileage of earth roads consisting mainly of sand-clay, top-soil and gravel types. The bearing power of these roads is high and the strength is great. There is still a problem surrounding them, since they offer very little resistance to abrasion, and with them the dust problem is great.

The problem is to secure some means of protecting the surface against abrasion and to abate the dust nuisance. This seems to have been found in the stone veneer surface, where the quality of an asphalt wearing surface is combined with the strength of an earth road. There have been several attempts made to apply bituminous material to earth roads. These, in general, have been unsuccessful because if the bituminous material is sufficiently light to penetrate the surface it has no binding power or strength whatever, and if the bituminous material is sufficiently heavy to have a binding value it would congeal on the surface and peel off, on account of the fact that a dust mat was formed underneath the bituminous material.

This problem seems to have been solved by applying a veneer of stone approximately three inches in size to the earth road surface and rolling it partly into the surface, after the surface has been scarified or loosened, and then penetrating the top of the stone with the bituminous material at a consistency to give sufficient strength to hold the material in place and afford resistance to wear. This bituminous material is then covered with proper sized stone and rolled and opened to traffic. The stone is held in place from below by the earth road and has become an integral part of it. The bituminous material holds the stone in place on the surface and affords a resistance to traffic abrasion. Thus we have the combination of the strength of an earth road and the wearing qualities of an asphalt pavement.

—*North Carolina Highway Bulletin.*

Suggestions for Improving the Present Budget Procedure in Cities

By A. E. Buck
New York Bureau of Municipal Research

The Basis for Control of Municipal Funds

As the indispensable function of a municipal budget is to control the year's financial program, the set-up of the budget must be designed, first of all, to guarantee control, and then, secondarily, to furnish the means for presenting information, educating the public, and developing plans.

The author of this article is the staff member of the New York Bureau of Municipal Research in charge of budget administration. He has had a broad and practical experience in budget-making, and has done a great deal to untangle and simplify budget classifications.

Mr. Buck does not recommend the classification used by the United States Census Bureau in its Financial Statistics of Cities as the basis for a budget. In his judgment, that classification is designed to summarize a great mass of diversified information and not to furnish the basis for control which is essential in a budget.

WHILE considerable progress has been made in the direction of developing and classifying the information needed for budget-making, much remains to be done in this field.

Lack of Uniformity in Budget Classifications

There is still a notable lack of uniformity in the expenditure and revenue classifications used by the various cities for accounting and budget-making purposes. Each city in adopting, for example, an expenditure classification, modifies the main classes, changes them around, combines them, and shifts sub-classes or items to other classes or groups, so as to adapt the classification to the peculiar procedure of the local accounting system or the whims of the fiscal officers. This naturally makes it difficult to set up expenditure comparisons between the cities. The smaller cities want a classification with only a few main heads, while the larger cities can use a classification with a considerable number of main heads. It seems desirable as a next step to devise an expenditure classification with only six or seven main groups or classes, one that will combine the essential features of the so-called object and character classifications and that will be easily adaptable to the expenditure needs of either a small or a large city. The following classification is suggested as meeting these needs:

10—Services—Personal
- 11—Salaries and wages regular
- 12—Salaries and wages temporary
- 13—Other compensations

20—Services—Contractual
- 21—Communication and transportation
- 22—Subsistence, care and support
- 23—Printing, binding and advertising
- 24—Heat, light, power and water
- 25—Repairs

30—Commodities
- 31—Supplies
- 32—Materials
- 33—Repairs (parts)

40—Current Charges
- 41—Rents
- 42—Insurance
- 43—Refunds, awards and indemnities

50—Current Obligations
- 51—Interest
- 52—Pensions and retirements
- 53—Grants and subsidies

60—Properties
- 61—Equipment
- 62—Buildings and improvements
- 63—Land

70—Debt Payments
- 71—Serial bonds
- 72—Sinking-fund installments

Of course, the sub-classes of this classification may be further expanded. Assuming that the city's activities are departmentalized along functional lines, then the organization units in conjunction with such a classification will show the essential in-

formation for budget estimate purposes, namely, what department or division is to do the work, what services and commodities are needed, and how much they will cost.

Another question remains to be answered; and that is, how the cost of the services and commodities needed is to be met. The revenues and other receipts of cities should be classified in a uniform manner. From the standpoint of comparative revenue data, this is just as essential as the uniform classification of expenditures. So far very few cities have attempted any systematic classification of their revenues. A simple revenue classification should be devised that will contain only about a half-dozen main groups or classes and that will combine the source, base and item designations. The following classification is suggested for cities:

10—Taxes
- 11—General property
- 12—Poll
- 13—Income
- 14—Business
- 15—Inheritance
- 16—Miscellaneous

20—Rights and Privileges
- 21—Licenses
- 22—Permits
- 23—Franchises
- 24—Concessions
- 25—Rents
- 26—Royalties

30—Services and Sales
- 31—Fees
- 32—Sales of services
- 33—Sales of commodities

40—Interest and Premiums

50—Fines and Forfeitures

60—Grants and Donations

In using the above classifications, the various revenues under each class or subclass should be specified.

Construction or Improvement Programs

Another point to emphasize in improving city budget-making is the adoption of construction or improvement programs extending over a period of five or ten years. This is especially applicable to street improvements, sewer construction, park and playground developments, and institutional developments. Recently a few cities have worked out and adopted improvement programs extending over a period of five years. Such programs show just what projects are to be undertaken and completed during each year, how much they will each cost, and how the money is to be raised to finance them. If part of the improvements are to be financed by bonds, the redemption charges can be spread equably over the future years so as not to overburden any one year and thereby increase the tax rate unduly. The different improvements can be distributed over a period of years, if necessary, so as to meet the growing needs of the city and at the same time not to burden the taxpayers with special assessments or other payments. The residents of the city then know exactly when they are going to get certain improvements and are not continually bothering the city council or the administration about them. In the case of institutions, the directing heads know definitely just how much they can expand each year under the building program as adopted. When it comes to making up the annual city budget, the matters relating to the development and financing of permanent improvements have been practically settled by the adoption of the improvement program. These matters do not come up *de novo* with the preparation of each budget.

More Informing Budget Document

The budget document prepared and published by most city governments is quite unsatisfactory from the standpoint of giving complete information about the fiscal program. Sometimes the detailed information necessary to the careful scrutiny of the plan is lacking. Sometimes the great mass of detailed information is not summarized so one can get a bird's-eye view of the budget plan. Without summaries the budget document is of little value to the general public.

What is needed is a budget document that is simple in arrangement, that presents all the necessary information about the proposed expenditures and the means of financing them, and that is carefully summarized so it can be easily understood. The main essential of the budget document of this kind is a single statement that gives a complete picture of the proposed expenditures balanced with the anticipated income of the city government. This general statement should be supported by five or six more detailed statements arranged in such a way as to present all of the outstanding features of the budget plan. It will then be unnecessary for the general public to study the detailed estimates, except to verify certain of the summary figures that may be ques-

tioned. From these summary tables the newspapers would draw most of the budget information for publication. In addition to the summary tables, the mayor or the manager should write a simple story, telling clearly and concisely about the main features of the budget plan, and it should be included in the front of the published budget document. This story should be such that all the newspapers in the city would publish it along with certain figures that they might draw from the summary tables.

Flexible Appropriation Ordinances

Cities usually enact appropriation ordinances that either set out the appropriations in extremely itemized form or combine them in large lump-sums. Neither of these forms is desirable. When enacted in great detail, the administration is tied hand and foot in the use of the appropriations unless a great many changes or transfers are made during the year. This forces the city council to have to "tinker" with the budget plan at frequent intervals, a thing that should be avoided if possible. When appropriations are made in lump-sums, there is the possibility of administrative laxness in carrying out the budget plan unless great care is exercised in the accounting control and reporting of expenditures. If lump-sum appropriations are made by the city council subject to "executive allotments" when the work is ready to be carried out, then this difficulty of transfers and shifts can be avoided. These allotments act as a restriction upon any loose spending, and since they are made by the chief executive the city council is relieved of having to bother with the budget except when extraordinary situations may arise. Another advantage of allotments is that the lump-sum amounts are not definitely budgeted out until just before the particular work to which they apply is begun, hence the estimates are again scrutinized at a time when they may be more carefully determined than when they were originally before the city council. By this method of putting on the city executive an allotment of former estimates, considerable money may be saved because of changed conditions that were not anticipated when the original estimates were prepared.

Minimum Changes in the Budget Plan After Adoption

Changing the budget after it has been adopted by the city council is one of the worst features of the budget procedure in a number of cities. When once the budget plan has been carefully thought out and adopted, it should be strictly adhered to by the city council unless some extraordinary or unforeseen circumstances should arise that require certain changes. Of course, it is usually necessary during the year to make a number of minor shifts or transfers in the plan as adopted, but these can be taken care of under the system of executive allotments mentioned above without vitiating the budget plan. The point is this: there is little use of going through the procedure of making up and adopting a comprehensive budget plan for the city unless it is to be binding upon the council as well as the administration. If the council is to be permitted to change from time to time the fiscal policies outlined in the budget, if it is to be allowed to appropriate additional revenues coming in during the year that have not been anticipated in the budget, then the budget fails to be what it was designed to be—a controlling financial plan.

Wider Publicity on the Budget

In most cities there is great need for wider publicity about the city's fiscal affairs at the time the budget is being adopted by the city council. The budget document, however well it is prepared, may not be read very widely by the residents of the city. A more striking means of supplying budget information directly to the public must be employed in most cities.

A few cities have tried public meetings as a means of giving to the citizens the salient facts about the city's fiscal program and actual accomplishments before the budget is adopted by the city council. Where this has been the practice for two or three years, it has stimulated the public interest in the budget program to a surprising degree. In the manager-governed cities the mayor usually presides over these public meetings, speaking on the fiscal policies as set forth in the budget and inviting questions and criticisms. The manager is also present at these meetings to explain any of the details relative to the expenditures and revenues of the city government. Such meetings make live news for the papers of the city, so that those citizens who fail to attend get the story through the newspapers.

The need for budget exhibits should be emphasized. Up to the present time only a few cities have made use of such exhibits. They should be set up periodically during the budget-making period in the city hall or some other building that is convenient for the people to attend. They consist of charts, diagrams, maps, placards, samples, and so forth that tell quickly and easily the story of where the city gets its money, how it spends this money, and what it gets for it. It is possible now for the city government to produce motion picture films of its more important activities, showing just what work is being done, and to send these films around the city to be shown in the different picture theaters. Such exhibits help the public to visualize and understand the work of the city government and are valuable means of civic education.

Village Manager Prefers Weekly Newspaper Articles to Annual Municipal Reports

To the Editor of The American City:

I was very much interested in the articles in the January, 1924, issue of The American City on annual reports of various municipalities operating under the commission-manager form of government. In my opinion, one of the greatest weaknesses of this form of government, as well as of the older form, is its failure to keep the public generally informed as to the actual status of the various municipal activities. In the past year, in our village, we have abandoned the plan of issuing an annual report, and instead have been using newspaper space, giving weekly publicity to municipal matters of general interest. Through the courtesy of one of the local papers, this space is secured without cost, and the articles are prepared by the City Manager.

There has been much favorable comment on these newspaper articles, and it is believed that they are widely read and generally appreciated. In preparing the articles, it has been our intention to give only actual facts and figures that can be verified by any one sufficiently interested to investigate, and no misleading propaganda is attempted.

It is our belief that this form of publicity is much more effective than the issuing of an annual report. Enclosed is a *clipping of one of the articles concerning the fire department, containing a summary of the Fire Chief's annual report. This is a sample of the articles published. Incidentally, we are quite proud of our volunteer fire department and the very good report it was able to make for the year 1923. It challenges any other volunteer fire department in a town with a populaion of 2,500 to better it.

J. H. BENDER,
City Manager.

Village of Clayton, N. Mex.
January 19, 1924.

*Editorial Note.—This article reports that for the year 1923 Clayton had the best fire record in the history of the village. Only six alarms were turned in during the entire year, and a total fire loss of but $165 was reported.

Denver Inscribes Its Colonnade of Civic Benefactors

SINCE the publication of the item on "Denver Has Announced Its First List of Civic Benefactors" in the February, 1923, issue of The American City, the Municipal Commission on Civic Benefactors of the city of Denver has carried out its plan of inscribing the names of those citizens on the colonnade in the south end of the civic center. The list of thirty names has been placed on the wall at the right of the colonnade here shown, and additional names of civic benefactors will be given similar recognition from year to year. The inscription on the colonnade reads:

"IN ORDER TO GIVE EFFECT TO THE OFT EXPRESSED INTENTION OF THE LATE MAYOR ROBERT W. SPEER, THE GOVERNMENT OF THE CITY AND COUNTY OF DENVER, COLORADO, HERE RECORDS WITH GRATEFUL APPRECIATION THE NAMES OF CIVIC BENEFACTORS WHO BY GIFTS OF MATERIAL CHARACTER HAVE ADDED TO THE BEAUTY AND DISTINCTION OF THIS CITY."

Construction and Maintenance of Sand-Clay and Top-Soil Roads—Part II

By W. R. Neel
State Highway Engineer of Georgia

Maintenance

WITH inadequate funds maintenance is a hopeless undertaking; therefore, the most important feature of successful maintenance is adequate financing.

The improvement of an entire system of highways either by maintenance or by construction attracts to these improved roads traffic from other roads and encourages and develops new traffic during winter months and rainy weather which, before the improvements were made, never existed; passenger bus lines, freight hauled by motor trucks, new sawmills and various other industries dependent upon good roads spring up.

AN IMPROVED ROAD IN EMANUEL COUNTY, GA., MADE BY SCARIFYING A WORN-OUT SAND-CLAY ROAD

The lack of good roads, the innumerable number of "road terrors," such as bog holes, rotten bridges, etc., have discouraged the use of our roads in bad weather, but the minute these weak links are removed the traffic multiplies—and always a class and weight of traffic in excess of the safe carrying capacity of the temporarily surfaced road.

The large mileage of sand-clay and top-soiled roads constructed in Georgia, together with the work done by the maintenance organization, have made possible continuous use of the roads the entire year. This has put the roads to a severe test, and I am convinced that unless the heaviest traveled roads are paved within the next few years they will rapidly deteriorate and again become unserviceable at certain seasons of the year.

It is impossible to devise an ideal maintenance scheme which will be suitable for each state. The equipment and organization must be selected after a careful study of the roads to be maintained. We have in Georgia eleven divisions, and the equipment and organization vary somewhat in each of them.

The maintenance of dirt roads requires an intimate knowledge of the particular road to be maintained, the class of soil, what effect water has on it, and how rapidly the soil dries out after rains. Certain road soils should be machined only when absolutely necessary to remove deep ruts which cannot be removed with the road drag or float. Certain soils require very careful dragging with just the right amount of moisture content to form a hard crust, after the forming of which it is very important to use no machine or type of tractor that will break this crust.

It is very important that the maintenance man be familiar with the seasons in order to anticipate rains in doing certain kinds of work on the road surface in his charge. Frequently it becomes necessary to plow up the road in order to thoroughly remix the material in the road surface. If this is done at a time of year when continuous

rains may be expected, the result will frequently be disastrous and even result in that particular section of road becoming impassable. Yet a certain amount of rainfall is required to aid in resetting the road surface material; otherwise, this newly plowed and harrowed section of road will become a dust bed, and a large amount of material which has been hauled on to the road will be lost by being carried away by the winds and traffic.

A maintenance man must be familiar with every hundred-foot section of the road under his charge. One part of the road which gets bad in wet weather may be remedied by the application of a few inches of coarse sand thoroughly cut into the surface; another section which gets soft and dusty in very dry weather may be improved by the addition of a good quality of clay.

On a long section of improved sand-clay or top-soiled roadway there are relatively few places that get bad in unfavorable weather. Careful study of each individual place by the patrolman and a simple remedy which can generally be easily and cheaply applied will result in the gradual improvement of a large mileage of highways, provided the traffic is not of such a nature or of such a volume that there is a general breaking down of the entire road surface when weather conditions are the slightest bit unfavorable. The only remedy for a condition of this kind is to have at one's command sufficient funds to construct a surface adequate for the traffic.

After a top-soil or sand-clay road has been properly constructed, the ditches should only be machined when absolutely necessary to provide a suitable waterway, and great care should always be used to prevent the mixing of the ditch material with the road-surface material. A fringe of Bermuda grass growing on the shoulder of the road will aid in separating these materials.

Patrol Maintenance

One hundred patrol sections properly equipped are a sufficient number for a 5,000-mile system of roads. Forty additional outfits equipped for heavy work, such as reshaping, scarifying, cutting ditches, etc., are a sufficient number of this class of equipment for this system, and ten supervisors with one assistant each can lay out and direct the entire work.

The training of maintenance men is the biggest undertaking of all, and after the state has made the large investment in these men that is necessary before their work really becomes most effective, radical changes in the laws governing the highway department should not be made which would cause the adoption of different methods and the consequent loss of the money already invested in the education and training of these men.

There is no better way of determining *where* and *when* and *how* to improve the road than by a careful study of maintenance effort and cost.

A sand-clay road will adequately serve the traffic of certain districts; in others gravel is required; and there are still other roads for which it would be a waste of money to construct anything less than the highest type of pavement. This statement might not appeal to you so forcibly before the improvement is made as after it is made, when the inter-city traffic which might be almost negligible before the improvement has been made, will become very heavy. The rural or local traffic will also increase, not only because the road can be used more days of the year by those accustomed to use that particular road, but also because a great many will use the improved road because it is so much better than the other available roads.

In this case, unless the improvement is adequate for the traffic, not only will maintenance cost become prohibitive, but traffic will be seriously handicapped in its use, and at certain seasons of the year actually blocked, as earth roads with a certain volume of traffic cannot be maintained in a passable condition through rainy spells.

Care for the Majority

The great majority of our roads will always be without a hard surface; therefore, the study of the most effective and most economical method for maintenance of dirt roads is most important. In the end the maintenance of this class of road will be the big problem, even overshadowing the construction. A combination of the so-called patrol and gang system of maintenance is best. Proper maintenance is the most effective and immediate way to serve traffic.

An Ideal Maintenance Organization for a 50-Mile Section

The following tables list the light equipment, labor, gas, oil and repair expenses for a 50-mile patrol section:

LIGHT EQUIPMENT

2—Tractors	$2,800.00
1—Truck	600.00
2—Road machines	1,200.00
1—Three-way drag	300.00
3—Small drags	40.00
Small tools	100.00
	$5,040.00 X 100 Sections

25 per cent depreciation

HEAVY EQUIPMENT

1—Ten-ton tractor	$6,000.00
1—Road machine	1,750.00
1—Road machine	1,200.00
1—Three-ton truck	2,400.00
1—Mowing machine	600.00
	$11,950.00 X 40 Sections

25 per cent depreciation

FIFTY-MILE SECTION—LIGHT MAINTENANCE

Equipment Valued at $5,040.00

	Per Month
Labor, equipment, gas, oil and repairs	$495.00
25 per cent yearly depreciation	105.00
6 per cent interest on equipment investment	25.90
Total	$625.90

FIFTY-MILE SECTION—HEAVY MAINTENANCE

Equipment Valued at $11,950.00 for Use on 125-Mile Section

Labor, equipment, gas, oil and repairs	$288.00
25 per cent yearly depreciation	99.58
6 per cent interest on equipment investment	23.90
Total	$411.48

OVERHEAD AND OFFICE EXPENSE

General supervision, special supervision, mechanical labor, accounting, office overhead, supplies, etc.	$117.00

All expenses chargeable to fifty-mile section Total	$1,154.38
For 1 mile	23.087
For 1 mile*	277.05

The above expense provides continuous work throughout the entire year

FIFTY-MILE SECTION

Labor, Equipment, Gas, Oil and Repairs

1—Patrolman (foreman and tractor operator)	$100.00
1—Machine operator	60.00
7—Truck driver or tractor operator	50.00
3—Laborers	90.00
2—Tractors (Cletrac type) gas, oil and repairs	100.00
1—One-ton truck (hauling laborers, tools and repair materials) gas, oil and repairs	50.00
2—8-foot road machines, repairs and replacing blades	10.00
3—Small drags, repairs and replacing blades	5.00
1—3-way drag or maintainer, repairs and replacing blades	20.00
Small tools, picks, shovels, pitchforks, mattocks, wheelbarrows, repairs and replacing same	10.00
	$495.00

Note: The above expense for light outfit.

ONE-HUNDRED TWENTY-FIVE-MILE SECTION

Labor, Equipment, Gas, Oil and Repairs

1—Tractor operator	$100.00
2—Machine operators	120.00
1—Truck driver	50.00
2—Helpers	60.00
1—Ten-ton tractor—gas, oil and repairs	320.00
1—12-foot road machine with scarifier attachment	
1—10-foot road machine—repairs and replacements	30.00
1—Three-ton truck—gas, oil and repairs	140.00
1—Mowing machine, repairs and replacements, small tools, picks, shovels, pitchforks, mattocks, wheelbarrows, repairs and replacing same	10.00
	$720.00

Note: The above expense for heavy outfit working in addition to the small outfits. In the average state having 5,000 miles of roadway under maintenance 100 light outfits will be required working in conjunction with 40 heavy outfits.

*Per year.

This 50-mile section would be under the charge of a patrolman who would also operate either the tractor or the road machine. He would be assisted by a machine operator, a truck driver and three laborers. On a system of 5,000 miles of road there would be 100 such outfits.

In addition to the lightly equipped outfit, there would be an outfit equipped for heavy work. This outfit would cover 125 miles of road, passing from one 50-mile section to another and operating under the direction of the patrolman in the section in which the outfit is at work. There would be 40 such outfits in the above-mentioned 5,000-mile system.

In addition to the expense of the above-mentioned outfits, there would be the division overhead and office expense; the ten supervisors and the ten assistants, a division mechanic and helper, accounting, office supplies, etc., of each division; then there should be in each state a central shop equipped for the overhauling and heavy repair work necessary to the successful operation and maintenance of so large an amount of valuable equipment and machinery—amounting in all for the 5,000-mile system to a little less than one million dollars.

As shown by the detail tabulations, the sum of the operating cost, yearly depreciation cost on equipment, interest on both the light and heavy maintenance outfits, and the overhead and office expense, there is a total cost chargeable to every 50-mile section per month of $1,154.38, amounting to a monthly charge of $23.087 for each mile of road and a yearly charge of $277.05 per mile.

This amount includes a yearly depreciation charge of 25 per cent and interest at 6 per cent on the equipment items. The interest charge should probably not be included. The supervisors of each division should report directly to the division maintenance engineers. There should be a chief maintenance engineer reporting directly to

the State Highway Engineer, attached to the main office in order to coordinate the work in the various divisions.

This, in my opinion, is a maximum outfit required to maintain the top-soil or earth roads on a 5,000-mile state system 365 days in the year; provided traffic is not too heavy, and provided the rainy spells are not of too long duration. Under these conditions an increase in maintenance expense would not materially improve matters. Earth roads will get wet, and when wet a sufficient amount of traffic will cut them up.

When to Drag

Experience on most roads in Georgia has shown that after a rain roads are in condition for dragging for not longer than two days following. With one dragging outfit on each section of the average length of 50 miles, it is possible to drag effectively, after each rain, one-third of the section. This requires three rains during the month to cover the entire section one time, or six different rains to cover it twice during any one month, the minimum number of draggings necessary to keep any of our dirt roads in fair condition.

With two outfits it is possible to drag an entire section after each rain if a suitable truck is used to drag, in addition to the tractor. In this way, by having a truck suitable for dragging purposes on each 50-mile section in addition to one tractor, it will only require two rains per month to keep the roads in reasonably good condition. Thus, it is seen to what a great extent the maintenance of dirt roads must depend upon the elements. By reducing the number of days the equipment and men are used in dragging, a greater number of days remain for hauling suitable repair material, reshaping ditches, opening up waterways, etc.

As shown in the equipment list, each light outfit has a 1-ton truck not only for hauling the material for patching road surface but also for the rapid transportation of the men to and from work.

I am indebted for a great deal of the information contained in this paper to Dr. C. M. Strahn, Dean of Engineering of the University of Georgia, who was probably the first engineer to begin to make a scientific study of top soils for surfacing materials, and who is a recognized authority.

An Appeal to Courtesy

AFTER vain attempts to make it a violation of the law for motorists to operate their machines on street-car tracks in the business district, the Los Angeles Railway conducted a campaign appealing to the fair-mindedness of the drivers themselves. During a Christmas holiday season, when traffic difficulties were at their worst, posters were placed on the right rear and left front of the cars, where they were plain to every eye, and were kept there for about fifteen days. The two posters read: "Mr. Autoist: Street-Car Riders Are in a Hurry, Too. Please Keep in Line. Thank You." And "Mr. Autoist: Give the Street-Car Riders Fair Play. Please Don't Block Traffic. Thank You."

"By putting the language in terms of the street-car rider rather than the street railway," said J. G. Jeffery, Director of Public Relations for the Los Angeles Railway, "it proved an effective means of enlisting the cooperation of the motorists, and very good results were procured. The conspicuous signs made it necessary for a selfish driver to have a pretty thick skin to be blocking 90 or more street-car passengers and staring one of the posters in the face."

For the purpose of keeping this appeal in the minds of drivers, the railway company detailed a young lady trained in traffic affairs and conditions to spend the two weeks preceding the holiday season on the cars in the business district. Each time she saw an automobile driver deliberately blocking the path of a street-car, or in any way interfering with a street-car rider's rights, she called the driver's attention to the appeal pasted on the car, and at the same time gave him a few hints on respect for the time and property of others.

To Eliminate Fire Hazards Resulting from Parking Automobiles

By William P. Capes

Secretary, Conference of Mayors and Other City Officials of the State of New York

RECOGNIZING the increasingly serious fire hazards from the parking of automobiles in streets and alleys in congested districts of cities, the New York State Bureau of Municipal Information has issued a special report on this problem. This report is based on data secured by questionnaire from 130 American cities, and on a study of the problem by a special committee of the State Conference of Mayors and Other City Officials, consisting of Mayor John A. Giles of Binghamton, and Fire Chiefs Elias J. Shadwick, Saratoga Springs; Henry R. Yates, Schenectady; Walter Jones, New Rochelle, and E. P. Murphy, Buffalo.

Findings of the Committee

The findings of the committee are summarized as follows:

Our survey shows that the parking of automobiles in streets and alleys, especially in congested districts, results in accidents to, and impedes the progress of, fire apparatus en route to fires, delays the placing of apparatus and the stretching of hose, hampers the work of firemen at fires, and lessens the efficiency of fire-escapes. To solve these serious problems, congestion of traffic must be eliminated and automobiles must be either kept away from buildings or so parked as not interfere with the operation of apparatus and the work of firemen in the event of a fire, especially in the business or high-value districts. The practice of chasing or racing with fire apparatus must be stopped and vehicles must be kept away from burning buildings.

Based upon our studies and the experiences of, and suggestions made by, fire departments of American cities, we make the following recommendations:

1. The elimination of the parking of all automobiles, except to take on or discharge passengers or freight, in all streets and alleys in congested districts is the only action a city can take which will effectively and permanently solve all of the problems herein presented. We believe that eventually this action will have to be taken by all cities. How soon such a regulation will have to be adopted by an individual city will depend upon local conditions, such as the layout and width of the streets, the density of traffic in its business district, the height of buildings and the rapidity with which motor traffic increases. Cities can gradually approach this permanent solution by providing for parking prohibitions during certain hours when congestion is the worst, or in certain streets where traffic is the heaviest. Exception may be made to cars parked single file and parallel to the curb when attended by driver. We do not believe that time limits on parking in a street will help to solve any of the fire department problems.

2. When parking can or must be permitted, we recommend the following:

   (a) Cars must be parked only in single file, parallel to the curb and at least 5 feet apart, unless parking in the center of the street is possible.

   (b) No parking within 20 feet of a fire-hydrant; 25 feet of the crosswalk at a street intersection; 75 feet of a street intersection where a trolley car stops to take on or discharge passengers; 15 feet of the entrance of any place of public assemblage; and 25 feet, on both sides of the street, from any fire-house.

   (c) No parking in alleys, except for a limited time for actually loading or unloading.

   (d) Prohibiting locking of gears and wheels of parked cars.

   (e) Establishment of one-way streets and requirement of parking on only one side of street when conditions are favorable, to facilitate traffic.

3. To stop the practice of motorists chasing to, and assembling near, fires, all vehicles should be required to keep at least 3 blocks or 600 feet behind fire apparatus, and the same distance from a fire.

4. The strict enforcement and observance of these regulations.

Amendments to General Highway Traffic Law Needed in New York State

In order that the cities of New York State may carry out two of our recommendations, it will be necessary to amend the General Highway Traffic Law. We, therefore, urge the State Legislature to amend subdivision 7 of Section 15 of the General Highway Traffic Law (Chapter 655, Laws of 1917), so that automobiles cannot park within 20 feet of a fire-hydrant or within 25 feet of a crosswalk at a street intersection, or within 75 feet of such intersection where a trolley car stops to take on or discharge passengers. The present limitations in both instances are 10 feet.

Open Spaces and Road Frontages in Housing Projects—II

By F. Longstreth Thompson
Member, Town Planning Institute of Great Britain

Subdivision of Land into Building Blocks

Size.—Without attempting to lay down any precise rules for the arrangement and spacing of these minor roads, attention may usefully be directed to certain principles of design which are of general application. The most important of these is the size and shape of the blocks of land into which it is most economical to divide the areas enclosed between the system of secondary streets. We are here confronted by two opposing considerations; on the one hand, the need for convenient access imposes an upward limit upon the size of the blocks; while, on the other hand, the necessity for economy in development requires that they should not be too small. Convenience of access in this respect need only be considered from the point of view of wheeled traffic, as provision for foot passengers can be provided without materially increasing the cost of development or modifying the layout. Even then it is difficult to decide at what point access becomes inconvenient, especially as in development at 12 houses to the acre the shape of the different blocks will be far from uniform. Hence a lineal dimension must also be accompanied by a superficial measurement, and on this basis it will usually be found that blocks having an area of approximately 10 acres and with no side exceeding a length of a quarter of a mile, constitute the most economical units of development. An example of such a unit is illustrated in Fig. 6, and further examples are shown in Figs. 8-11.

Shape.—The shape of the block is not of paramount importance in the case of open development, as the reduced density allows greater freedom of planning, and parallel roads—two house plots apart—are not only not essential, but, being generally less economical than other arrangements, are to be avoided as far as possible. Provided, therefore, that the blocks are not too narrow, nor too acute-angled, almost any shape can be developed economically. The majority of those used in practice, however, can be considered in relation to the following typical figures—the rectangle, triangle, trapezium, and segment of a circle. The sector and part-sector of a circle—forms frequently encountered—can con-

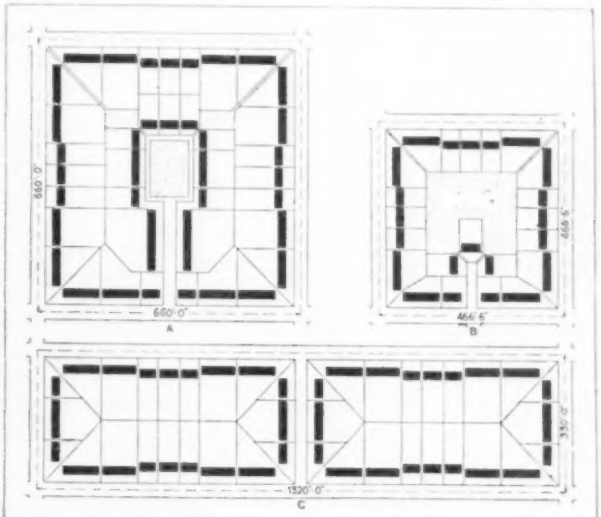


DIAGRAM	A	B	C
AREA OF BLOCK IN ACRES	10	5	10
ROAD FRONTAGE PER HOUSE: 36' Rd.	21·4'	29·9'	26·9'
" " " " LIGHT Rd.	8·5'	3·7'	4·9'
" " " " TOTAL	29·9'	33·6'	31·8'
COST OF ROADS & SEWERS PER HOUSE:	£.	£	£
36' ROAD @ £1·14·0 PER Ft FRONTAGE	36·8·0	50·18·0	45·18·0
LIGHT ROAD @ £1·3·0 " "	9·15·6	4·5·0	5·13·0
TOTAL	46·3·6	55·1·0	51·8·0

FIG. 8. COMPARATIVE COST OF DEVELOPMENT FOR RECTANGULAR BLOCKS OF DIFFERENT SIZES AND SHAPES

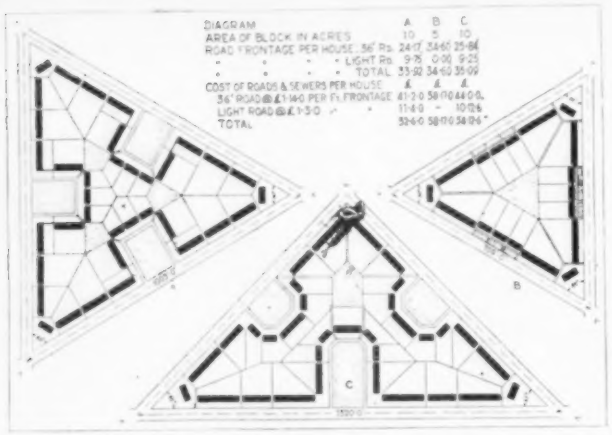


FIG. 9. COMPARATIVE COST OF DEVELOPMENT FOR TRIANGULAR BLOCKS OF DIFFERENT SIZES AND SHAPES

veniently be approximated respectively to a triangle and trapezium for the rough calculations that are necessary, while blocks of a shape too irregular for comparison with any of the standard figures must necessarily receive individual examination.

Proportions.—In order to arrive at the proportions which are theoretically the most economical for development, several factors have to be considered. At first sight it would seem that from the point of view of available frontage, those proportions would be best which result in a figure possessing the maximum perimeter for the area enclosed. If this were the only consideration, long, narrow shapes such as those illustrated in Fig. 7 would be preferable to squares or circles in which the ratio of the periphery to the area enclosed is at a minimum. But the other factors in the case act in the opposite direction. The limitations as to area and length imposed by traffic requirements automatically prevent the adoption of the long, narrow block, while the difference in cost between the light roads which can be used for the internal development of the block, and the heavier roads surrounding it, renders it desirable to make the maximum possible use of the light roads. On this account, therefore, it is advisable to employ blocks having a small perimeter but at the same time offering the greatest opportunity for internal development by means of light roads, culs-de-sac, etc. A further guide in the matter is the desirability of reducing the loss at corners to a minimum. This factor does not affect the shape of rectangular blocks, but it has a direct bearing upon that of the other typical shapes. It has already been pointed out that the waste of frontage at a road junction is least in the case of a right angle owing to the increased loss occurring at an acute angle being much greater than the diminished loss at an obtuse angle. Hence in the case of triangular, trapezoidal, and segmental blocks, the most economical form will be that in which the angles most nearly approach right angles; an equilateral triangle will, therefore, be the best shape in its group, and a semi-circle in the segmental class. But while a trapezium obviously grows more economical as it approaches the rectangular form, it loses at the same time its own characteristics, and if these are to be preserved, it is necessary to set up an arbitrary standard; under these circumstances it may be said that for a typical trapezium the best shape is that in which the acute angles are about 60°.

Dimensions.—The actual dimensions of the different-shaped blocks which comply with the foregoing conditions with regard to area, length of side, perimeter, and angles at corners, can readily be determined. Thus, amongst rectangular shapes, a square having sides 660 feet long fulfils the conditions as to area, length of side, and angles, and at the same time possesses the minimum possible perimeter; it is clearly, therefore, the most economical form of rectangle. The limitation of the angles to 60° at once determines the shape of triangular blocks, and the equilateral form also provides the smallest perimeter; with sides equal to, in round numbers, 1,000 feet, an area of 10 acres is enclosed without exceeding the permissible length of side. In the case of the trapezium, as in that of the rectangle, the perimeter is the deciding factor; this is at a minimum when the length of the side equals the mean between the top and base,

and for the required area the dimensions will be, base 1,065 feet, top 355 feet, and sides each 710 feet. It is difficult to determine the most economical proportions for the segmental form. The more nearly it approaches a complete circle, the greater will be the economy in the length of the boundary road; but, on the other hand, the internal space is more difficult to develop, and, with the smaller radius required to enclose the specified area, the disadvantages of tapering plots and the additional loss between the blocks of houses inherent in the circular form, are intensified. Moreover, where complete circles are used, they almost invariably occupy the center of a scheme of roads based upon the spider's web, and, for convenience of traffic, are divided into sectors by the principal roads. This is also generally true of all segments greater than a semi-circle, so that we may reasonably confine our attention to segments equal to or less than a semi-circle; of these, the semi-circle is from every point of view the most economical form; a diameter of 1,052 feet will give the requisite area.

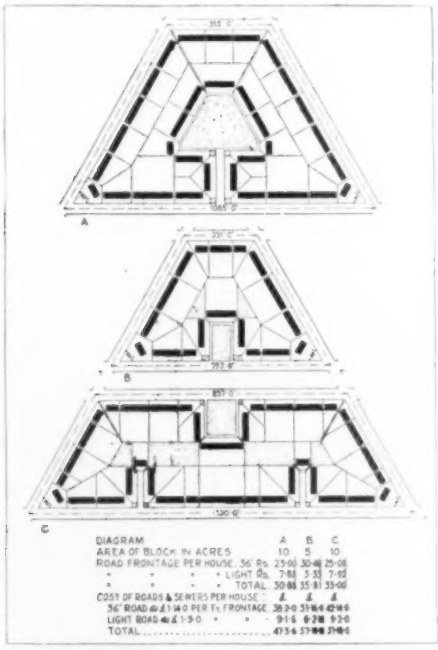


DIAGRAM	A	B	C
AREA OF BLOCK IN ACRES	10	5	10
ROAD FRONTAGE PER HOUSE. 36' Rd.	23·00	30·48	25·08
" " " LIGHT Rd.	7·48	5·33	7·92
" " " TOTAL.	30·48	35·81	33·00
COST OF ROADS & SEWERS PER HOUSE :	£	£	£
36' ROAD @ £1·14·0 PER Ft. FRONTAGE	26·2·0	33·16·4	27·16·8
LIGHT ROAD @ £1·3·0 " "	9·1·6	6·7·8	9·2·0
TOTAL	47·3·6	57·18·8	37·18·8

FIG. 10. COMPARATIVE COST OF DEVELOPMENT FOR TRAPEZOIDAL BLOCKS OF DIFFERENT SIZES AND SHAPES

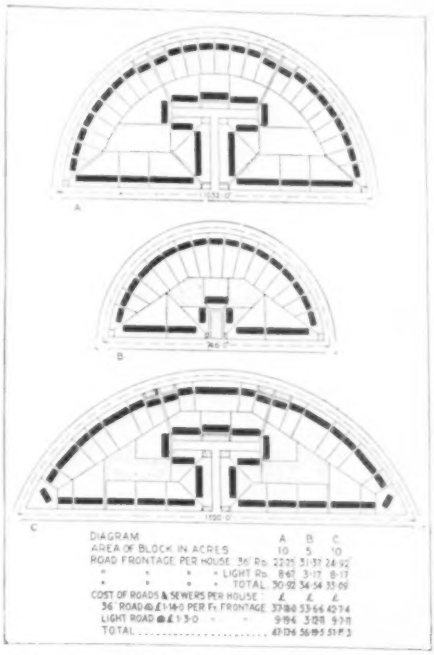


DIAGRAM	A	B	C
AREA OF BLOCK IN ACRES	10	5	10
ROAD FRONTAGE PER HOUSE. 36' Rd.	22·25	31·37	24·92
" " " LIGHT Rd.	8·67	3·17	8·17
" " " TOTAL.	30·92	34·54	33·09
COST OF ROADS & SEWERS PER HOUSE :	£	£	£
36' ROAD @ £1·14·0 PER Ft. FRONTAGE	37·8·0	53·6·6	42·7·4
LIGHT ROAD @ £1·3·0 " "	9·19·6	3·19·8	9·3·0
TOTAL	47·17·6	56·5·6	51·10·3

FIG. 11. COMPARATIVE COST OF DEVELOPMENT FOR SEGMENTAL BLOCKS OF DIFFERENT SIZES AND SHAPES

The dimensions of these typical shapes have been worked out in some detail in order to ascertain the most economical form in each case. These data will be a most useful guide in the determination of the general layout of the minor roads, but it is not, of course, suggested that the objects of estate development will be achieved by the adoption of certain standard geometrical figures. There are always some local considerations which influence the layout in a particular direction, but, at the same time, in any plan for a reasonably flat site, the roads must inevitably cut up the land into blocks corresponding to one or other of the typical shapes we have been considering, and it is useful, therefore, to have certain standards which are known to be the most economical in their class and to which, accordingly, it is desirable to approximate as closely as the exigencies of the particular case allow. There will, however, be many instances where anything like a close approximation is not practicable. In the rectangular and trapezoidal figures, especially, there is likely to be considerable divergence between the practical and

theoretical proportions, and in such cases it becomes essential to consider the effect upon the shape of the block, of the size and shape of the house plot.

ACKNOWLEDGMENT.—Reprinted by permission of the Oxford University Press, American Branch, New York, from portions of chapter VI of the author's new book on "Site Planning in Practice." A section reprinted from chapter VIII of this book appeared in the February issue as part I of this article.

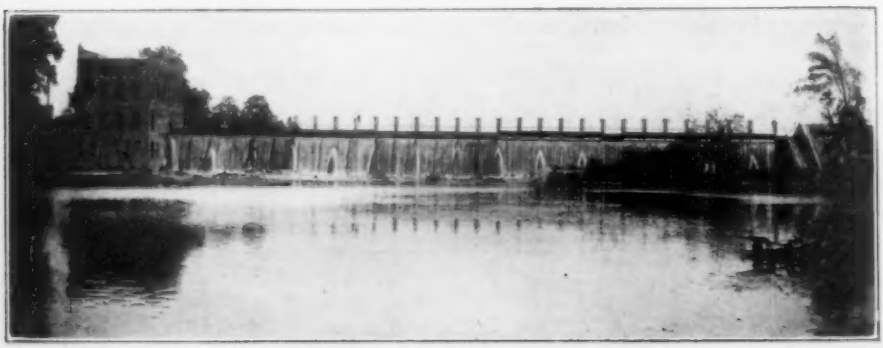
Municipal Dam Helps Village Development

THE acquisition of a power site on the St. Joseph River and the construction of a municipal dam are two factors that have helped to raise Sturgis, Mich., from the rank of a quiet, obscure village to that of one of the leading small industrial cities in the state.

A number of years ago, when the possibilities of a municipal dam for Sturgis were first realized, Frank W. Wait, now Mayor of the city, secured an option on a power site and dam six miles west of Sturgis and turned it over to the municipality. A plan was then put before the City Council for the purchase of the site. Before any action could be taken, however, it was necessary that flowage rights be obtained, and to meet this contingency the embodying in the new state constitution of a clause, giving municipalities the right to condemn land for flowage, was secured. Certain power companies made strenuous efforts to frustrate the project, and numerous minor obstacles had to be faced, but the purchase was finally made by the city. A new dam, 300 feet wide, developing 1,500 horse-power, with a connecting power-plant, was then constructed at a cost of $215,000. The plant is now in successful operation and is proving a source of considerable income for the city.

Since the completion of the dam, fourteen industries, attracted by the low power rates, have located in Sturgis, and the population of the city has increased from 3,000 to nearly 8,000. Three years ago the commission form of government was adopted, and since that time the city's tax rate has dropped from 9½ mills to 4½ mills, which is believed to be lower than that of any other city in the state. An additional tax of 1 3/5 mills will be levied this year to provide for the operating expenses of a $100,000 hospital now being built, and to pay the interest on the bonds used for the construction of the building.

The city now has sixteen miles of paved streets and thirty miles of sidewalks; its water and electric light plants are municipally owned, and its bank deposits are well over $2,000,000. During the past year a $12,500 fire engine was purchased, a $16,000 Gamewell fire-alarm system established, and a $7,000 Kelly well installed—all of which were paid for in cash out of the city's general funds.



THE MUNICIPAL DAM, STURGIS, MICH.

Cooperation with Latin-American Municipalities

By L. S. Rowe
Director General, Pan American Union

IN the recent political development of the countries of Latin America, there is growing appreciation of the importance of strengthening municipal organizations and activities. They appreciate, as we appreciate, the fact that the daily life, the standard of comfort and, in fact, the social and economic development of a country are affected much more closely by the character and efficiency of its municipal institutions than by any other factor in national life. The recent improvements in municipal organization in the United States have aroused much interest throughout Latin America and have given rise to a no less marked desire for a well-organized interchange of experience, in order that every municipality on the American Continent may benefit by the experience of its sister cities.

Unless I am much mistaken, there is a wide-spread feeling in the United States that our municipal experience carries with it many lessons to Latin America, but that we have little to learn from Latin-American cities. This is far from being the case. From the point of view of what may be called the social and artistic activities of organized government, the Latin-American cities have much to teach us, for they have never permitted the haphazard building development which has characterized our American cities. In the matter of civic planning, the laying out of parks, the construction of public buildings and the beautifying of water-fronts, the larger cities of Latin America are far in advance of most of our American communities.

The extension of the sphere of action of the National Municipal League so as to include Pan American cooperation in the solution of municipal problems will constitute a real forward step in the development of closer relations between the republics of the American Continent. The recent International Conference of American States, usually referred to as the Pan American Conference, which assembled at Santiago,

PHAROUX PASSENGER LANDING AT RIO DE JANEIRO, BRAZIL

WHARF AT CALLAO, PERU

Chile, in March last, recognized the importance of this movement by adopting a resolution recommending that the governments of the American Continent facilitate in every possible way the establishment of closer ties between the municipalities of North, Central and South America and that they foster the interchange of data and experience, in order that each municipality may profit by the successes as well as by the failures of its sister cities.

ACKNOWLEDGMENT.—Abstract of an address delivered before the recent joint session in Washington of the National Municipal League and Governmental Research Conference. An illustrated pamphlet on the Ports and Harbors of South America may be secured from the Pan American Union, Washington, D. C., on application.

Insurance Rates—an Individual and Community Responsibility

ACCORDING to the degree of efficiency of water-works or other fire-extinguishing agency, and of the fire department, its men and equipment, each city or village is given a certain basis rate of insurance. Whether that basis rate be favorable or not depends on the municipality and its attitude on fire protection.

Beyond this, each individual insurer is largely responsible personally for the rate he pays. Every fire hazard he harbors and tolerates within his building and every exposure from without add to this basis rate. He is solely responsible for fire hazards within his building, and he can at least protect himself against exposure hazards.

If the individual is complacently satisfied with unclean conditions within his building, with defective electric wiring, poorly installed heating plants, defective chimneys, poor shingle roofs and other well-known hazards, and with entire lack of even the simplest kind of fire protection, he must pay for his neglect by increased rates.

It may be argued that the individual is not responsible for his surroundings and exposures. In part that is true, but he can at least use his influence to have vacant, old, dilapidated firetraps near him condemned, thus adding to the safety, attractiveness and health of the community. With the help of the fire department he can get the careless neighbor to clean up his yard and alleys and so remove fire breeders and fire spreaders. In all cases he can protect himself against exposures by installing wire-glass windows in metal sash and frame, fire-shutters and fire-doors and fire-resisting roof coverings in place of dangerous wooden shingles. All such improvements are reflected in a more favorable rate of insurance. Every man can equip his place of business with simple, first-aid fire-extinguishing equipment, such as approved fire extinguishers, water barrels and pails and interior stand-pipes with hose connections. Where large values are involved, he can install the automatic sprinkler system, the best known protection of both life and property. The concession in rates for such an approved system will in a few years pay for the installation.

American insurance rates are high, much higher than in European countries; and appreciable reductions in rates can only come with a decrease in American fire losses. Municipalities must strengthen their fire-fighting means, that the losses per fire may be kept at the lowest possible mark, and every citizen and property owner must work to eliminate conditions which cause fires, or which cause fires to spread.

What is your community doing, and what are you doing individually to reduce fires and fire insurance rates?

Rates must always be sufficient to pay for all fire losses and for the expenses of conducting the insurance business.

—From a Bulletin issued November 15, 1923, by the Industrial Commission of Wisconsin.

New Street-Lighting System Enhances Beauty of Street

By D. R. Snider

Superintendent, Municipal Electrical Department, Augusta, Ga.

GREEN STREET, which is considered one of the most beautiful residential streets in Augusta, Ga., has been made still more attractive by the installation of a new street-lighting system. This thoroughfare is about 2 miles long and has a green 41 feet wide in the center, on each side of which is a 42-foot driveway and a 10-foot sidewalk.

The new lighting system consists of 76 French design King posts equipped with Novalux ornamental lighting units, placed alternately on the outer sides of the green at intervals of 270 feet, which is equivalent to one standard and lighting unit for each 135 feet of street frontage. Two posts are placed at each street intersection, and all posts are installed on foundations 24 inches square.

The system is divided into five circuits with an RO transformer with 2,300-volt primaries and is equipped with a time-clock. The secondary is a 7.5-ampere series circuit. The 2,300-volt, rubber-parkway, No. 8, single conductor is laid next to the curb along one side of the green, looping across to each post, and is about 18 inches below the surface of the ground. In crossing intersections or paved cross-streets, 3-inch creosoted ducts were laid. In making the installation, the street was crossed at the end of each circuit and the cable was laid down one of the side or cross-streets so that it would not show on Green Street. The system is grounded at every post with a ⅝-inch copper-clad ground rod.

A VIEW OF GREEN STREET, AUGUSTA, GA., SHOWING NEW STREET-LIGHTING STANDARDS AND ALSO THE TALL WOODEN POLES WHICH ARE TO BE REMOVED SHORTLY

All the units are equipped with 400-candle-power lamps, which give the desired amount of light. The street is heavily shaded by numerous large trees, and it would have taken many overhead lights at $1.50 more per light to illuminate it than by the present system, which cost $10,500. The overhead wires which now run down the central parkway or green on high wooden poles are to be removed, thus adding materially to the present already attractive appearance of the street.

Water Meters in Chicago

ACCORDING to the Forty-Seventh Annual Report of the Chicago Department of Public Works, for the year ending December 31, 1922, 1,545 new meters were installed, of which number 74 replaced smaller services. The total number of meters in service on December 31, 1922, was 32,034. The average cost of maintenance was $4.18.

All "Beat" and No Play

By C. A. Crosser

Secretary, Commission of Publicity and Efficiency, Toledo, Ohio

ALL "beat" and no play makes Jack Policeman a dull officer.

Inauguration of police recreational programs has come about because of a number of reasons. It has become more apparent that municipal police service must be made more attractive to obtain recruits. It is obvious that young men are not likely to be induced to enter a service which pays only from $125 to $150 a month, when they can get as high as $225 monthly in the skilled trades.

For this reason the policeman's vocation must be lifted out of the category of the trades, and enhanced with some of the attractive aspects of college or a high type of military service, to compensate for the low remuneration.

Another thing which reacts against the attractiveness of police work is the increased personal risk. The possibility of injury or death in the policeman's calling is far greater now than it was a score of years ago. The daily papers bear this out in the frequent items recounting the death of an officer of the law at the hands of daring robbers or other lawbreakers.

Organized Recreation for Police and Fire Departments

To ascertain the extent of the movement for organized recreation for the men, which has been spreading among the police and fire departments of the United States in recent years, the National Committee on Police Welfare has secured, at the request of the Toledo Commission of Publicity and Efficiency, the information on which the accompanying article is based. It appeared originally in the Toledo City Journal for December 22 and 29, 1923.

Reports from 48 Cities

Chiefs of police of 48 cities in the United States and Canada replied to the questionnaire sent out by the National Committee on Police Welfare. The liberality of Canadian cities, including Hamilton, Ont., Toronto, Vancouver, Winnipeg and Ottawa, with respect to police recreation, is especially brought out in the replies.

Inauguration of athletics in police departments in some of the cities has come within the last six years and may be traced to the success of organized recreation programs in the cantonments during the World War. On the other hand, athletics have been a recognized feature in the police departments of a few of the larger cities for a number of years; for example, Toronto police athletics date from 1893. Organized athletics have been in existence in the New York Police Department for a great many years, and some of the metropolitan police track athletes have made great names for themselves in the world of sport.

Athletic activities are carried on both during working hours and off duty, in Chicago, Toledo, Worcester, Ottawa, Can., Trenton, N. J., Salt Lake City, Omaha, Detroit, Paterson, N. J., Washington, D. C., and San Francisco. In 16 other cities all recreation is had off duty. The different reporting officials, including chiefs and superintendents of police, expressed a diversity of views as to whether organized recreation should be engaged in on or off duty. Eighteen asserted that it should be off duty; ten, on duty; and four that it should be required both on the men's regular time and when off duty.

Indoor and Outdoor Athletics

In 19 cities either the police departments have their own gymnasiums or gymnasium facilities are available.

Almost all the American cities reported having police baseball teams. A lesser number also have basketball, football and track teams. A number of others offer all-around gymnasium work. In a few cities, including Jersey City; Fargo, N. D.; Dallas, Tex.; Bridgeport, Conn.; Pittsburgh and Reno, Nev., members of the police force do not participate in any form of organized

recreation under department supervision.

The following have police baseball or football teams: Scranton, Trenton, Boston, Hamilton, Salt Lake City, Mobile, Toledo, Omaha, Toronto, Norfolk, Akron, Springfield, Mass., Detroit, Seattle, Winnipeg, New Haven, Paterson, Fall River, Des Moines, Minneapolis, Manchester, N. H., Louisville, Washington, Ottawa, San Francisco, and New York. A smaller number have track teams.

Eleven departments provide instruction in boxing and wrestling.

Annual police or police and fire field days are held in Buffalo, Chicago, Detroit, New York, Akron, St. Louis (circus), Trenton, Jersey City (intermittently), Hamilton, Toledo, Toronto, Norfolk, Vancouver, Seattle, Winnipeg, Pittsburgh, New Haven, Worcester, Fall River and Ottawa. The proceeds from such events in most cases go to pension or benevolent funds and in others to the police athletic and social clubs. In the following cities pensions or benevolent funds benefit: New York, Chicago, Scranton, Jersey City, Salt Lake City, Toledo, Akron, Vancouver, Pittsburgh, Worcester and Minneapolis. In the following cities the athletic or social clubs get the receipts: Trenton, Hamilton, Norfolk, Seattle, Winnipeg and New Haven.

"PAVEMENT POUNDING" MAY MAKE FLAT FEET, BUT THIS DID NOT STOP THE TOLEDO PATROLMEN FROM WINNING THE HALF-MILE RACE FROM THE FIREMEN IN THE 1923 TOLEDO POLICE-FIRE FIELD MEET

THE TOLEDO POLICE "HUSKIES" WINNING THE TUG-OF-WAR OVER THE FIREMEN IN THE 1923 FIELD DAY.

Increased Recreation Facilities Planned

An increase in the scope of recreational facilities is planned in the following cities: Oakland, music and field days; Providence, new gymnasium; Norfolk, drum and bugle corps; Toledo, gymnasium; Columbus, track team; Cleveland, band concerts in public parks; Louisville and Toronto, field days and music features.

Endorsement of police recreation as shown by the results is given by 23 heads of police departments. Only 6 assert that recreational features are not particularly justified.

There are police athletic clubs in the following cities: Hamilton, Norfolk, Toledo, Omaha, Toronto, Grand Rapids, Mobile, Vancouver, Seattle, Winnipeg, New Haven, Manchester, Ottawa and New York.

Police bands or orchestras have been organized in the following cities: Los Angeles, St. Louis, Jersey City, Boston, Salt Lake City, Detroit, Vancouver, Seattle, Winnipeg, Minneapolis, Louisville, Cleveland, New York and Chicago. There are glee clubs or quartets in Los Angeles, St. Louis, Portland, Seattle, New Haven, San Francisco, New York and Chicago.

Thirty-eight departments have regular pistol practice, while ten make no provisions for this activity. Military drill is required in 31 cities.

Recreation Program of the Toledo Police Department

The recreational program in the Toledo Police Department, inaugurated by Chief of Police Harry Jennings, includes base-

ball, football, track, basketball, bowling and pistol teams. All of these police athletic aggregations have made creditable records for themselves in the realm of local sport.

A Police and Firemen's Field Meet was held last summer.

A recently organized police orchestra has been favorably received at several performances.

Chief Jennings says that about 25 per cent of his men have participated in these different recreational activities. While this percentage is not as large as could be desired, yet every man on the force has the opportunity of participating in them, the Chief says.

The development of pistol teams will be materially encouraged by the completion of the new pistol range at Bay View Park, said to be one of the finest in the country.

The Chief also hopes to make an arrangement with the University of Toledo which will enable members of the force to take courses in criminal law, rhetoric and other studies which will assist the officer in his work.

Much of this recreation is done on regular time. The Chief and the Safety Director believe that this is proper, inasmuch as athletics and marksmanship contribute vitally to the development of a first-class policeman. It is pointed out that organized recreation is considered an established phase of the military and navy curriculum and therefore would have a similar application to the police department, which is a semi-military organization.

Fourth-Class City---First-Class Ideas

By Earl M. LaPlant

President, Door County Chamber of Commerce, Sturgeon Bay, Wis.

WITHIN a period of less than a year —since the election of our present Mayor—there have been added to the municipal improvements of Sturgeon Bay two miles of sewers; a complete system of artesian water, with supply tank for fire protection; a park at the end of Main Street with fountain, comfort station and band-stand; and a municipal playground 330 by 250 feet, electrically lighted, with a 300-foot retaining wall, used also for a skating-rink in the winter. For the comfort of the children there has been placed at the extreme end of the skating-rink a warming-house with city heat, such as we believe is not to be found elsewhere in the state of Wisconsin.

All these improvements for adults and children have been made at a cost of about $5,000, every cent of which has been raised in small donations from the public. There has also been brought to completion a Main Street White Way, on which work had been done before. Every telephone and telegraph pole has been placed in the alley-ways, and on Main Street granite lighting posts with 400-watt lamps have been installed. The Westinghouse Electric & Manufacturing Company furnished the electrical equipment, and the standards were manufactured by the Massey Concrete Products Corporation, of Chicago. One-half of the installation cost has been paid by the city, and the rest by the property owners.

Our Mayor, James G. Martin, under whose leadership this work has been done, is manager of the largest sour cherry orchard in the world, three miles from

THE MUNICIPAL SKATING-RINK IN STURGEON BAY, WIS., IS ALSO USED AS A CHILDREN'S PLAYGROUND IN SUMMER

MAIN STREET, STURGEON BAY, WIS., BEFORE IMPROVEMENTS

Note the unsightly telegraph and telephone poles on both sides of the street

MAIN STREET, STURGEON BAY, AFTER THE INSTALLATION OF THE WHITE WAY

The poles have been removed to alley-ways and granite lighting standards have been erected

Sturgeon Bay. For his work for the city he receives the munificent salary of $450 a year. His first salary was turned over to the Police Department for uniforms. By his unselfish spirit and ability as a leader, he has created a movement throughout the city to improve its beauty, and has brought about an unusual unity of ambition among the citizens for the betterment of the community. The Mayor is fortunate in having with him a Council that is just as progressive in its ways as he is in his. Indeed, every officer of the city is trying to make Sturgeon Bay one of the finest places in the state to live in.

As an example of the cooperation shown, the warming-house for the children on the playground is moved to the center of the town for the summer and is used for the Chamber of Commerce office. The organization is an active one and has a paid secretary. The city officials have the cooperation also of the Rotary Club, and, in fact, of all the organizations of the city. We are proud of the fact that Sturgeon Bay is a fourth-class city with first-class ideas.

Editors of Newspapers and Bulletins

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Thinking Ahead for the Relief of Street Traffic Congestion

What an Adequate Fact-Finding Survey of Local Traffic Conditions Should Cover

By J. Rowland Bibbins
Consulting Engineer, Washington, D. C.

IN "The Battle of the Streets," in THE AMERICAN CITY for October, 1923, the writer outlined some important elements of the so-called "traffic problem," covering not only street-traffic control, but also transit operations, street and highway systems, commercial vehicle and freight trucking, the railroad terminal system, and the relation of each to the broad city and district plan. From this analysis, it seemed clear that we have aimed entirely too low in our expedient methods of handling "the problem," which have not brought results adequate to present needs, to say nothing of the future. It is now clear that every city should be hard at work upon a more fundamental traffic-transportation plan, at the bottom of which lies the need for fact-finding in a broad sense.

The Primary Key to City Development

The transportation plan must be recognized as the primary key to proper city development, not the football of politics or of commercial exploitation. Upon its effectiveness every citizen and every legitimate business, particularly the local transit system, whether by trolley or bus, is inevitably dependent. The plan should be coordinated with, and not subordinated to, other phases of the city plan. It is not a detail to be passed over with an elusive brush. It is fundamental to a city's life. But there is every reason, nevertheless, to conserve to the maximum the esthetic and spiritual values of a properly conceived city plan.

Such a transportation plan, adequate to a growing city's needs, cannot be evolved over night from the inner consciousness of a group of busy business men trying to match their ideas upon a set of standardized conclusions collected from various other cities, where conditions may be entirely different. Every situation is a law unto itself, and the only way to secure an adequate basis for intelligent action is to determine the underlying facts first by a proper technical survey of the local conditions. Then an adequate program can be developed in three stages suited to the needs and resources of the community:

1. For the present time at minimum cost
2. For the near future, at moderate cost
3. For ultimate development

What Should a Survey Cover?

The transportation survey authorized by the Massachusetts State Legislature for Boston and its 42 surrounding communities covers broadly the principal elements. But the specific studies necessary in any given location vary widely in character. Some of the more important studies were presented by the writer in testimony before the U. S. Senate Committee on Traffic Conditions in the District of Columbia, largely included in the report of that committee dated January 22, 1924. To quote in part:

"This survey should determine at the outset the most important physical conditions and facts, such as:

- The totalized movement of traffic in and out of and through the congested district
- Relative capacity of the key street crossings
- Efficiency of various traffic signal methods
- Efficiency of use of one-way and two-way streets
- Means of distributing traffic concentration
- Means of segregating traffic and transit streets
- Density and parking time prevailing, with the proportion of violation
- Average parking time and facilities required for short-time parking, as distinct from long-time parking or day

storage
Analysis and interpretation of the record of traffic accidents and of the effectiveness of the present system of correcting traffic violations

"The survey should also appraise the relative value of present traffic streets and *facilities and future needs*, such as:

The limiting of roadway widths and obstructions
The reconditioning of streets as to paving and continuity
Development of cross-town and by-pass streets to relieve the central district
Relative roadway capacity and distribution, in-bound and out-bound
Best ways and means of carrying out street widenings most economically and with least destruction to the valuable trees shading our roadways
Centers of gravity of present developed building floor space convenient to the delivery district
Grade crossing, bridges and other throat obstructions
Study of commercial trucking, origin-destination and best methods of routing, loading and dispatching to relieve central congestion
Possibilities of improving store-door delivery and avoiding street obstructions during new building operations
Possibilities of appropriate development of sub-sidewalk space
Means of facilitating pedestrian movement

"This survey should incorporate, so far as possible, studies for:

Simplifying street-car routing and operation
Decreasing transit time through the delivery district by reducing track interferences
Increasing street-car loading speed and operation throughout the system

"And, finally, the survey should develop the trends and *tendencies* in the growth and density of settlement throughout the whole metropolitan area:

The probable future development and distribution
Where future transit will most likely be concentrated
Probable new traffic routes and throats
Best relation of this traffic street system to the tributary highways leading into the District
Probable needs of the rapidly expanding business district
A scientific forecast of the future population, transit and motor traffic, commercial freight tonnage, etc., for which the city should now be in preparation

"An important study related to the survey which should be carried out simultaneously is, *Where is the money coming from* and how fast can improvements go on?—

An analysis of the present and future funding power of the city, based upon its assessed property value and all other sources of revenue
The proper allocation of this revenue for transportation and traffic purposes, with the proximate cost and maintenance of projects recommended
The allocation in the annual budget therefor to (a) traffic, (b) property benefited, and (c) the general public
In other words, to apply the balanced-budget for traffic and transportation purposes

"*The legal aspects* of the traffic situation constitute a separate question, part of which, such as a traffic court and impounding law, can be acted upon promptly, independent of the physical survey while it is under way.

"The development of a *new model code of traffic regulations* should wait upon such an engineering survey as has been suggested, for the present codes are in the main good ones."

The Objects of This Plan of Survey for Any City Will Now Be Clear

1. An adequate thoroughfare plan, with scientific classification of streets and design of roadways, paving and operations for the traffic they are carrying or may reasonably be expected to carry.

2. A scientific traffic organization and control system, based upon ascertained traffic needs, rather than opinion, predilection, fancy or experiment. This includes prominently the improved handling and routing of commercial vehicle and trucking movement, and cartage control, which is a much larger part of the problem than is generally realized.

3. A plan of transit routing, operation and service, adjusted to the traffic and civic needs of the community on the principle that maximum speed and convenience and adequate service are paramount and that the American public will finally support the best service it can secure.

4. A railroad terminal plan which will avoid the vast expenditures now needlessly wasted in the congested districts and avoid adding to the passenger congestion by needless intra-city or cross-town freight trucking collection and delivery now surging through passenger thoroughfares.

5. The best relation of all these elements to the whole city plan and to the general public welfare, without which any city plan must be seriously defective or even abortive.

What should be the program of action? The following steps are essential:

1. Schedule and budget a definite street

reconditioning program for five years ahead, to develop reasonably soon on the essential arteries and by-pass streets the full roadway capacity needed.

2. Plan now for a city of double the present size, without stopping to quarrel at just what date that event will take place. It will be sure to come too soon.

3. Entrust this transportation plan to technical leadership, or to a commission whose personnel embraces the special qualifications and experience appropriate to the difficulty of the task.

4. Provide ample funds for field and staff work. Such an enterprise is worthy of more than niggardly financing. The work will be largely without precedent and will return infinite dividends to the community.

5. Organize a competent local civilian body to consider this plan and subject it to constructive criticism and furnish the powerful support which such a body can give. This is its proper function, not the original development of the plan itself.

6. Make transportation, above all, a continuing development, linked in with the public works program and considered in the same category with construction and finance.

To Keep Street Areas at Crossings Free from Standing Vehicles

To the Editor of THE AMERICAN CITY:

Some of your readers may be glad to contribute their ideas as to a practical method of relieving traffic congestion at the place where the chief difficulty usually comes—at street crossings or junctions. In a developing area, for example, stores, garages and filling stations are generally located at crossroads. The area at the junction has to do double duty to begin with; then every car or team that stops adds still further to the difficulty.

The value of setback lines is often entirely lost because without such lines the street or road will carry all the traffic that can be cleared at the junctions. How can this double-duty area at street crossings be kept free from standing vehicles?

I have worked out one solution whereby the corner properties take care of their service trucks and cars of customers inside the building line. I presented the problem to J. Henry Duffy, Town Engineer of Lexington, Mass., and he has added a protective feature in the shape of a small island at each corner. The accompanying plan shows an actual illustration of how it would work, prepared by Mr. Duffy for the junction of Waltham Street and the State Road, Lexington.

Horace B. Gale, of Natick, President of the Massachusetts Federation of Planning Boards, suggests another plan, consolidating the islands at the center, thus forcing through-traffic to slow down and probably avoiding the need of a traffic officer. Opposed to this is the suggestion that the central island would make night driving dangerous. The island would be lighted and, while possibly dangerous to reckless drivers, would probably add to the safety of others.

The thing cannot be done by any rule, a circle with a certain radius, or any similar device, because streets come together at all angles and with all sorts of curves. An adaptation of the idea must be worked out for each situation. If the principle could be tied up with zoning, a drawing of each problem to scale being made a part of the local zoning law, it would save an enormous expense for ultimate widenings, with the resultant destruction of property. The application of the principle would be for the safety, comfort and general welfare of the people. Is there any reason why it could not be done under the police power?

In considering the problem, it should be remembered that a street should be like a water pipe—able to discharge all it can take in. If one wants to carry water from one place to another, there is no good in providing an 8-inch main for the entire distance and putting in a 4-inch gate at some point for shut-off purposes. An 8-inch gate must be provided. Should we not do the same with our streets?

The following section, or something like it, in a zoning ordinance would meet the

PLAN FOR JUNCTION OF WALTHAM STREET AND STATE ROAD, LEXINGTON, MASS.
Showing small island proposed for each corner

need if it can be worked out in this way:

"Street Corners in Business Districts.—To promote safety and convenience and to prevent congestion and traffic hazards, the treatment of corners in business districts, as shown on the zoning map at the intersection of important streets, shall be as shown on detailed plans prepared by J. Henry Duffy, Town Engineer, signed by the Planning Board and dated. . . . . , 1924. These detailed plans, filed with the zoning map, are hereby made a part of this by-law."

This problem is worth some effort. Will not those interested help to work it out?

EDWARD T. HARTMAN,
State Consultant on Housing and Town Planning.

37 State House, Boston, Mass.
January 14, 1924.

Watch Your Asphalt Specifications

APPARENTLY some highway officials and consulting engineers have not fully realized that, beginning January 1, 1924, manufacturers, in accordance with the recommendations adopted at the Asphalt Paving Conference held by the Department of Commerce, are making asphalt of only nine definite penetration limits for the construction of sheet asphalt, asphaltic concrete and asphalt macadam pavement and for surface treatments, and four penetration limits for joint fillers and various other types of construction, including brick and granite block pavements.

Highway engineers of thirty states, the American Society for Testing Materials, the American Society for Municipal Improvements, the American Society of Civil Engineers, the U. S. Bureau of Public Roads, the Asphalt Association, and five non-members of that association, have officially accepted the standards mentioned.

Engineers and street and highway officials in some instances are still specifying other than the thirteen definite limits which have been set. In this way they are increasing the price which the manufacturer must charge for the special asphalt, because the refining processes and storage of asphalt are now standardized for the grades agreed upon. Further information may be secured from any of the asphalt companies, the Asphalt Association, or the Department of Commerce, Washington, D. C.

Public Health Helps for Municipal Officials—Part II

By Carl E. McCombs, M. D.
National Institute of Public Administration

EDITORIAL NOTE.—*Dr. McCombs classifies health department functions into five main divisions. The first two—prevention of communicable diseases, and child hygiene—were discussed in Part I of this article. In the second instalment, which concludes the article, he discusses the other three functions—food sanitation, general sanitation, and keeping of vital statistics. The small figures found throughout the text refer to the list of selected references at the end of the article.*

Food Sanitation

THE question of milk standards is one that appears to be a favorite subject of municipal controversy. As the result, we have throughout the country the widest possible variation in milk regulations. There are, of course, other factors than health to be considered in the regulation of the milk supply. It is conceivable that standards might be set so high that producers would be forced out of business, with a resulting milk shortage, or would be compelled to charge such a high rate for their product that the people most needing milk for food would be compelled to go without it. But is is perfectly possible to have a thoroughly sanitary milk supply without imposing impossible conditions upon producers or consumers. For many years a commission on milk standards appointed by the New York Milk Committee has been at work developing milk standards suited to the health and economic requirements of American communities.[10] A joint committee representing the New York State Health Department and the New York State Conference of Mayors and Other City Officials has also recently prepared a model milk ordinance, which in its essentials follows the recommendations of the commission on milk standards.[11] This code will be found extremely useful to any city wishing to revamp its own milk regulations.

With respect to the inspection of food other than milk, the essential thing is to see to it that food, particularly meat, is not contaminated with disease-producing organisms anywhere in its route from producer to consumer. Cattle may be infected with disease organisms prior to slaughter, and in the majority of instances such infection is tuberculosis. Inspection of animals at slaughter by a competent veterinarian is the only method of excluding infected meat. Once it has reached the retail stores, inspection is of very little value. In a city deriving its meat supply from sources outside the state, the meat bears the stamp of inspection by Federal authorities, an inspection that is generally recognized as competent. If produced and slaughtered within the state, it may not have been inspected at slaughter. The city need concern itself therefore only with the latter supply. For inspection of such supply, the standards of the Federal Bureau of Animal Industry should be the guide. In general, it may be said that cattle slaughtered on local farms, that is, "country killed" meat, is more likely to be disease-infected than that which passes through a public abattoir, for the reason that the average small farmer does not take as great care to protect the health of his cattle as does the large cattle grower.

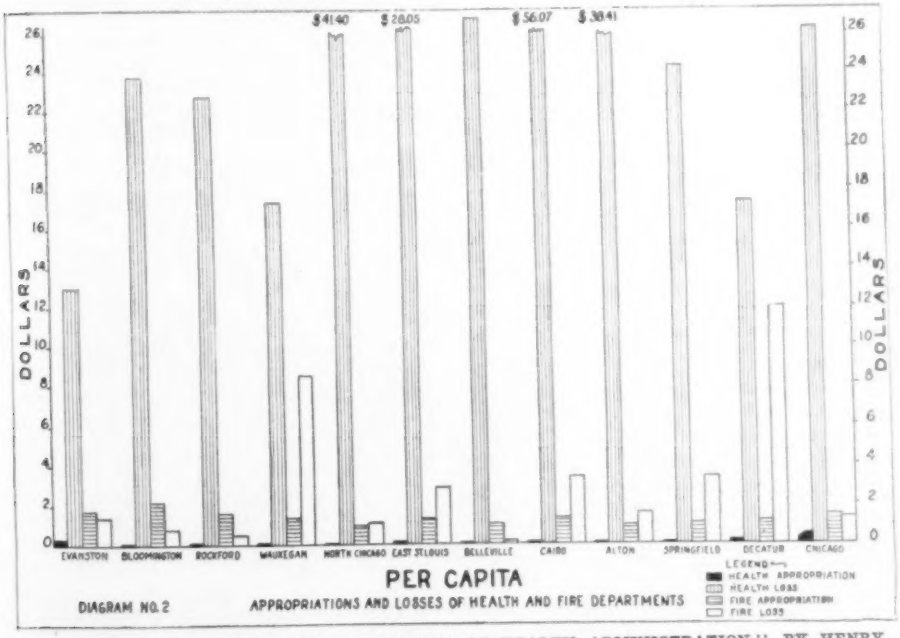
Other chief sources of food contamination to be watched are flies and food handlers. Flies can be eliminated by proper disposal of wastes and screening. To protect food against disease contamination from food handlers requires their proper physical examination and the exclusion from the food-handling business of persons infected with communicable disease. This procedure is gradually gaining ground in progressive city health departments, and the results of such examinations have dem-

onstrated that it is a worth-while procedure. Physical examination of food handlers and the refusal of permits to those found with communicable disease is an established procedure in New York City, Newark and many other cities. Reference is made to a monograph on The Health of Food Handlers, published by the New York City Health Department, and a report on The Examination of Food Handlers, by the Newark, N. J., Health Department.[12]

For routine sanitary inspection of food stores a scoring system is needed that will permit concentration of inspection where it is most needed. There should be, first, a general survey of all establishments, classified according to the nature of their business. On the basis of this preliminary survey, inspection should be directed to those groups of establishments where conditions are most unsatisfactory from the health view-point. All should be scored and a certificate of rating issued to each. Inspection should then be centered on those having lowest scores. By this method of inspection, coupled with the issuance of certificates of grade, it should be possible to eliminate from routine inspection those establishments which have a high rating. As the rating of those places scoring low is raised through inspection, the necessity for routine inspection should become less and less, provided all establishments are licensed annually and licenses granted only upon evidence of satisfactory sanitary conditions. More detailed comment by the writer on food inspection methods is included among the references at the end of this article.[13]

General Sanitation

With respect to general sanitary inspection—what is ordinarily known as nuisance inspection—there is little to say. Much of the work now done by the sanitary inspectors of a municipal health department could be and should be done by the police, since it is more often a matter of good policing than health control. It is important, however, in the interest of citizen cooperation, to see that nuisance complaints are properly attended to by someone and that there is a complete record of the circumstances in each case. By properly registering and classifying nuisance complaints, extremely valuable information regarding local conditions can be obtained by the health officer. Anonymous complaints

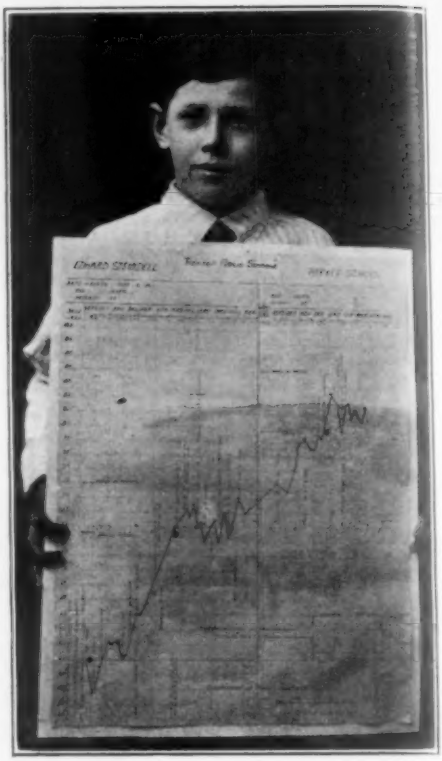


A CHART REPRODUCED FROM "ECONOMICS OF HEALTH ADMINISTRATION," BY HENRY BIXBY HEMENWAY, M.D., DISTRICT HEALTH OFFICER, SPRINGFIELD, ILL.

are frequently ignored by health authorities, but this is a mistaken policy. Many times important information is received through anonymous complaints. Citizens should be encouraged—and not discouraged—to complain. The citizen who makes a reasonable complaint and gets prompt action on it from his government invariably feels good about it, and he is likely to appraise his government's efficiency in direct proportion to the attention it gives to his personal needs, regardless of questions of public benefit.

One great difficulty in developing a rational program of health administration in many cities is that local ordinances and regulations are the patchwork result of several years of special enactment, influenced variously at different periods by changing conditions of community life and changing political régimes. Many times it is extremely difficult for the investigator to determine what the responsibilities of a health department are, because a complete set of ordinances and regulations cannot be found. Perhaps they were printed in local papers of which no files were kept; perhaps only typed copies were made and these have been lost; perhaps they were printed in the proceedings of the city council or other legislative body and have to be hunted for most assiduously without the aid of a satisfactory index. Many times ordinances are found that contradict other ordinances without repealing them; many times local ordinances are passed that have not the support of the general public health laws of the state; many times local regulations are still considered to be in force when they have in fact been repealed. Even when all ordinances and rules and regulations have been gathered together it is well nigh impossible to lay out from them a program that will conform to their requirements without a most uneconomic expenditure of funds.

The city that hasn't a well-developed, properly correlated code of ordinances and regulations based on the public health law of the state and upon modern approved practise in health administration, ought, before it prepares its next budget, to find out what health responsibilities it has and proposes to assume, and enact a health code that will provide for their satisfactory administration. Such a health code is a vital necessity to the health officer for the



A STUDY MADE IN THE PUBLIC SCHOOLS OF TRENTON, N. J., OF THE REHABILITATION OF A MENTALLY DEFECTIVE CHILD

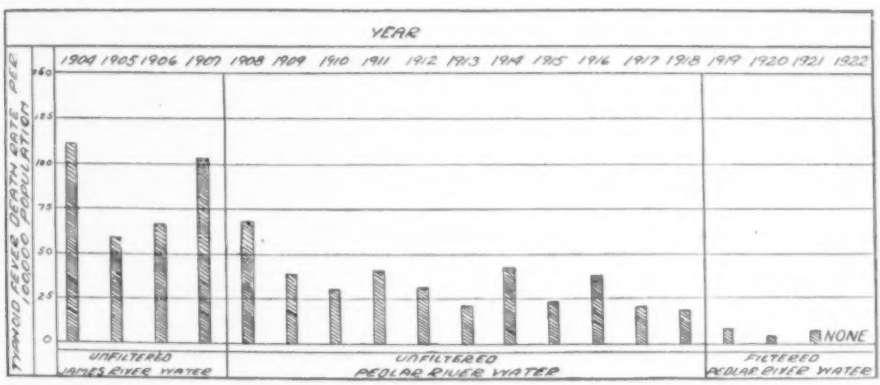
Reproduced from "Growing Healthy Children," published by the U. S. Bureau of Education for the American Child Health Association

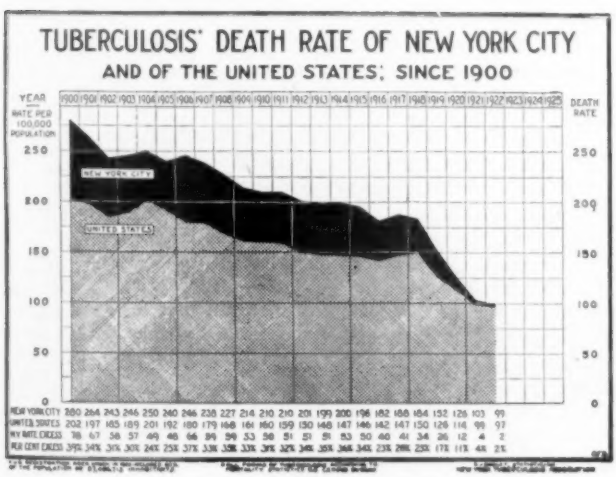
direction and training of his subordinates; it is essential also for the information of the police and others who may be called upon to enforce health regulations, and it ought to be a text-book for the use of the citizen whose education as to his own health duties and obligations has been so sadly neglected. To be most effective, any revision of health ordinances and regulations should be done en bloc rather than piecemeal; otherwise issues are likely to be raised and controversies stirred up with respect to minor matters which in considering a single enactment of the code as a whole would be ignored. If a satisfactory unified health code cannot be enacted, then the piecemeal method may be resorted to, but the former method is the method of choice. A model health code for cities covering the basic principles of health organization and control of communicable

diseases has recently been prepared by a special committee on Model Health Legislation of the American Public Health Association.[14] This model code will be found extremely useful to cities that wish to draft a code to meet local requirements.

The Keeping of Vital Statistics

Let us assume that a health program based upon the principles which we have briefly outlined has been developed in a given city; it follows that a thoroughgoing system of vital statistics registration and research ought to be provided by which the results of the program can be measured. It is important that this service, "the bookkeeping of health," be placed under the administrative control of the health authority. If it is otherwise administered, as is the case in many cities, it is likely that





THREE GRAPHS SHOWING DIFFERENT METHODS OF PRESENTING VITAL STATISTICS

Upper.—Reduction of typhoid fever death-rates in Massachusetts, from pamphlet on "The Use of Semi-Logarithmic Paper in Plotting Death-Rates," by George C. Whipple, Professor of Sanitary Engineering, Harvard University; and Miss A. D. Hamblen, Statistician, Massachusetts Department of Public Health

Middle.—A chart from the last annual report of the city of Lynchburg, Virginia

Lower.—A graphic method devised by G. J. Drolet, Statistician of the New York Tuberculosis Association, for showing the death-rate for all forms of tuberculosis, according to mortality statistics of the U. S. Census Bureau, for New York City and for the entire registration area of the United States

the technique of registration which has been prescribed as standard by the United States Bureau of the Census will not be carried out thoroughly. It is extremely difficult for the registrar who lacks public health training and intimate knowledge of its aims and methods to appreciate the significance of many apparently unimportant facts about birth and deaths. The health officer is the one person in the community who, having an understanding of the aims of health service and responsibility for the activities carried on, is capable of guaranteeing efficient vital statistics registration.

It is impossible to discuss here the technique of vital statistics work or the uses of vital statistics in public health administration. City officials should, however, be familiar with the accepted standards of practise and should be able to understand and interpret in terms of community health the reports submitted by their health officers. The references given at the end of this article have been selected with these needs in mind.[15]

If a city has the good fortune to have as its health executive a competent, full-time progressive health officer on whom it may rely in framing public health policy, it is to be congratulated. If it hasn't such a health executive, the first step in improving health service is to get one. But whether there is a competent full-time executive or not, the city officials should understand the essential elements of a health-producing administrative program. The science of public health administration has, with respect to such a program, passed beyond the experimental stage. Standards of health practice and procedure have been set up which, if adopted, will guarantee results in any community. Certain of the reports embodying these standard health procedures as approved by authoritative bodies of health specialists were referred to at the end of Part I. Some others are here listed:

(10) Report of the Commission on Milk Standards of the New York Milk Committee; Reprint No. 634 of Public Health Reports, Government Printing Office, Washington, D. C.

(11) Model Milk Ordinance, recommended by a joint committee representing the New York State Conference of Mayors and Other City Officials, New York State Department of Health, Albany, N. Y.

(12) The Health of Food Handlers; report prepared by Louis I. Harris, M. D., Director, Bureau of Preventable Diseases, New York City Health Department, and Louis I. Dublin, Ph.D., Statistician, Metropolitan Life Insurance Company; Monograph Series No. 17 of the New York City Health Department. Also The Examination of Food Handlers; report of Charles V. Craster, M. D., Health Officer, Newark, N. J.; Monthly Bulletin of the Newark Department of Health, August, 1922

(13) Protection Against Food Contamination, by Carl E. McCombs, M. D., Chief of Division of Health of New York Bureau of Municipal Research; American Journal of Public Health, September, 1918

(14) A Model Health Code for Cities; the Report of the Committee on Model Health Legislation of the American Public Health Association; Reprint of the American Public Health Association, 370 Seventh Avenue, New York City

(15) Vital Statistics, A Discussion of What They Are and Their Uses in Public Health Administration, by John W. Trask, Assistant Surgeon General, United States Public Health Service; Supplement No. 12 to the Public Health Reports, April 3, 1914

The Registration of Vital Statistics and Good Business, by Louis I. Dublin, Ph.D., Statistician of the Metropolitan Life Insurance Company; pamphlet published by Metropolitan Life Insurance Company, New York City

Practical Uses of Vital Statistics, by Shirley W. Wynne, M. D., Chief of the Division of Statistical Research of the New York City Health Department; Reprint Series No. 66, February, 1918, New York City Health Department

NOTE.—As mentioned in a foot-note at the end of Part I of the foregoing article, there is now available for 50 cents, from the Government Printing Office at Washington, Public Health Bulletin No. 136, Report of the Committee on Municipal Health Department Practice of the American Public Health Association in cooperation with the United States Public Health Service. This document presents in summary form the results of an examination of municipal health department practice in 83 of the larger cities of the United States, summarizes its major defects and offers constructive recommendations for remedying them. Among the most interesting special articles in this report is An Ideal Health Department for a City of 100,000 Population, by C.-E. A. Winslow, Dr. P. H. and H. I. Harris, M. D., of the Department of Public Health, Yale School of Medicine. Every municipal official ought to read, at least, this section.

New Health Film Available

COINCIDENT with the campaign for the encouragement of periodic health examinations launched by the National Health Council, the Metropolitan Life Insurance Company has produced an excellent motion picture entitled "Working for Dear Life." This film interestingly tells the story of the average man who scoffs at the idea of periodical health examinations because, he says, he's "as sound as a dollar," and an ingenious parallel is drawn between the mechanism of that least understood machine—the human body—and that of the best-known—the automobile.

"Working for Dear Life" is for free distribution, but it is hoped that all exhibitors who can do so will meet the necessary transportation charges. The film may be obtained from the Welfare Division, Metropolitan Life Insurance Company, 1 Madison Avenue, New York City. Literature and posters dealing with health examinations, appropriate for use in advertising the film, may be obtained from the National Health Council, 370 Seventh Avenue, New York City.

Chamber of Commerce Activities in Public Affairs

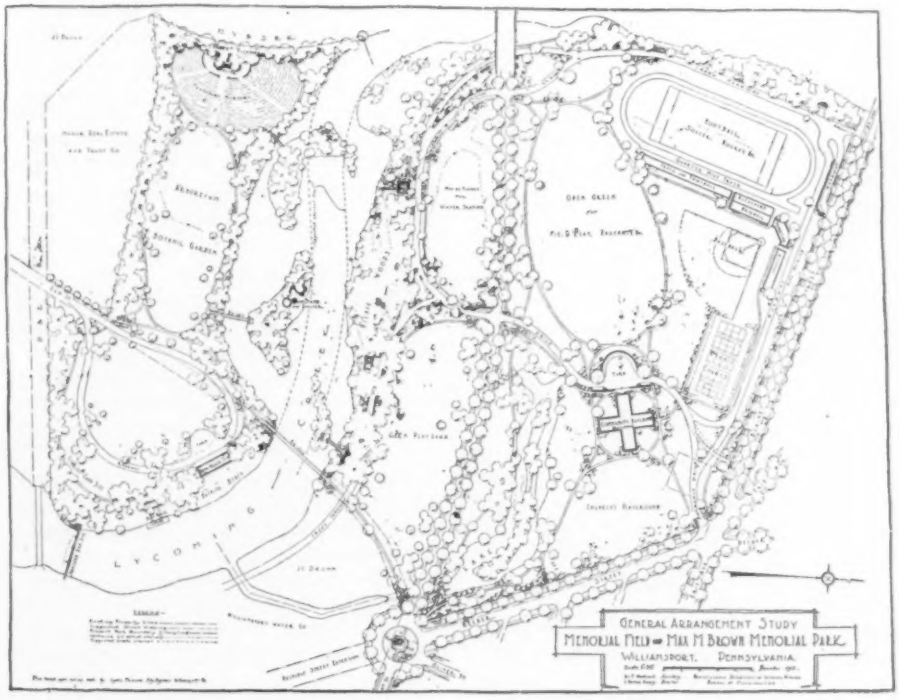
Water Company Deeds 110 Acres to City for Park Purposes

WILLIAMSPORT, PA.—This city can now boast of approximately 200 acres of municipally owned parks and playgrounds, as the result of the generous gift of 110 acres to the city by the Williamsport Water Company, a privately owned corporation. This company has transferred the land to the city of Williamsport by a "deed for uses, with reservations." It is to be used only for parks and recreation purposes, and the city must adopt a plan of development and begin to carry it out during the first two years of its control of the land; after which it is expected to expend not less than $2,500 a year to carry out the plan and maintain and operate the grounds.

As this land is adjacent to Memorial Park, the opportunity presents itself for the establishment of a continuous system of parks, with the possibility of a boulevard extending from the river along Lycoming Creek to the hills north of the city. According to plans already proposed, the new addition may be easily turned into a municipal golf course of eighteen holes, although this matter has not been definitely decided upon.

The offer of the Williamsport Water Company to deed this land over to the city has been pending almost two years, and was finally brought about by the combined efforts of the City Planning Commission and the Chamber of Commerce, and close cooperation between officials of the Water Company and the Williamsport City Council.

W. S. MILLENER,
Secretary-Manager, Williamsport Chamber of Commerce.



Reappraisal, City Planning Board and Ten-Year Prosperity Program

DAYTON, OHIO.—Since its reorganization in July, 1923, on a new basis of affiliation with all the existing luncheon clubs, civic and trade organizations in the city, the Dayton Chamber of Commerce has been successful in bringing about two important movements making for the future general development of the city along constructive lines. The first of these called for a reappraisal of property values, and the second for the creation of a City Planning Board.

During the past twelve or thirteen years the population of this city has greatly increased, and with this growth has come a corresponding increase in land values. Such increased valuations, however, have not heretofore appeared on the tax duplicate. The newly organized Chamber of Commerce, therefore, made the securing of a reappraisal of property its first important undertaking. After many months of effectual work in overcoming various obstacles, the order for a reappraisal was issued on January 21 of this year. The work will probably be completed by October 1, 1924, and it is estimated that the tax duplicate will be increased by at least 100 per cent, resulting in a corresponding reduction in the tax rate.

As its next activity, the Chamber undertook to secure the creation of a City Planning Board, this board to have complete jurisdiction over boulevards, streets, elimination of grade crossings, designation of municipal and county buildings, zoning, etc. To employ the city planning experts and assistants necessary to carry out this plan, it was estimated that an expenditure of $25,000 would be required; and as no funds were available in the City Treasury for this purpose, the Chamber agreed to underwrite the movement. An ordinance creating a City Planning Board, becoming effective immediately, has since been passed by the City Commission, and the personnel of the Board will be selected by the Commission from recommendations submitted by the Chamber.

This step accomplished, the Chamber of Commerce has now inaugurated a Ten Years' Prosperity Program, in which it is proposed to centralize all of Dayton's present and estimated future needs for the next fifty years in a combined bond issue to be voted upon by the electorate at a special election to be held early in the year 1925. Included in this suggested program of improvements are the following:

- Elimination of grade crossings
- Abandonment of canal and utilization for civic purposes
- Municipal water-softening plant
- New school buildings
- New city hall
- New county court house
- Storm and sanitary trunk sewers
- Sewage disposal plant, including interceptors and pumping-stations
- Additional parks and playgrounds
- New fire department buildings and equipment
- Paving and resurfacing of streets
- New public library
- New Civic Building
- Patterson memorial
- Wright memorial
- Completion of Southern Boulevard
- New County Children's Home
- River improvement (dam)
- Adequate pay for city employees
- Extension of city limits

A commission of forty or fifty citizens will shortly be appointed by the Chamber to secure accurate data on all these projects preliminary to a publicity campaign to be conducted during the three months prior to the special election. The cost of this publicity campaign, estimated at $50,000, will be underwritten by the Chamber. The municipal, county and railroad expenditures covered by this program will approximate $50,000,000, and coincident with this will be required an expenditure of private capital amounting to from $150,000,000 to $200,000,000. While authorization of such of these expenditures as must be met by municipal bonds will be voted upon at the one election next year, the appropriation of the funds will be distributed over a period of from ten to twelve years, according to the needs of the various projects and existing conditions.

WALTER B. MOORE,
Managing Director, Dayton Chamber of Commerce.

A Small City Cleans Up

SANGER, CALIF.—Realizing the importance of cleanliness in the community as a whole, the city of Sanger, under the management of the superintendent of the local grammar schools, held a thorough, well-directed clean-up campaign on January 12 last.

In order that the citizens might be well informed as to the part which they were expected to play, handbills and cards containing quotations from the city ordinances covering sanitary conditions and garbage and rubbish disposal were printed. These were distributed several days previous to the campaign by the boys of the grammar schools.

As a part of its cooperation in the work, the local Chamber of Commerce invited the Chief of the Fire Department of Fresno to address the regular weekly luncheon meeting of the Chamber, on the value of clean-up activities. The meeting was also addressed by the State Sanitary Inspector, who happened to be in Sanger at that time on a tour of inspection. Immediately following the luncheon, the two speakers, accompanied by a member of the official Clean-up Campaign Committee, made a trip through the business district, visiting all basements and storerooms, in order to look into the sanitary conditions, and also to recommend improvements that would help to bring about a reduction in the local fire insurance rates.

For the purpose of the clean-up drive, the city was divided into four sections. To each section were assigned three trucks, each truck manned by a captain and ten school boys in addition to the driver. At eight o'clock on the morning of January 12, over 240 volunteer workers assembled, clad in overalls, and began the actual task of cleaning the city. Their work did not cease until all vacant streets and lots were clean, and the rubbish removed to the city dumping grounds. At noon the workers gathered for luncheon at one of the vacant lots in the center of the city, where tables had been set up for the occasion. Seventy-five gallons of stew had been prepared in three large iron kettles and coffee made on kerosene stoves, and the meal was served by a group of twelve school girls under the supervision of the one woman member of the official committee.

SUMMERFIELD McCARTENEY,
Secretary, Sanger Chamber of Commerce.

Reducing the Ravages of the Rodents

FLINT, MICH.—At the suggestion of the local Board of Health and a representative of the United States Department of Agriculture, the Flint Junior Chamber of Commerce last summer inaugurated a campaign against the 100,000 rats estimated to be in existence in the business and residential sections of the city. In emphasizing the need for some action of this kind, the health officers pointed out that, according to Department of Agricultulre statistics, a single rat consumes or destroys approximately $2 worth of food and property in a year. Figuring on this basis, the city of Flint was evidently suffering a total loss of $200,000 annually through the ravages of the rodents. This fact, and a realization of the great extent to which disease is spread by rats, made the campaign one well worth the efforts of the Junior Chamber.

In carrying out the details of the campaign, and in rousing the cooperation of the general public, the Board of Health and members of the local Boy Scout troops rendered every possible assistance. Several thousand packages of poison were prepared by the Dairy and Food Department of the Board, together with members of the Junior Chamber, under the direction of the local rat exterminator. The packages were then distributed by Boy Scouts among 250 of the down-town stores, and the poison placed as bait in the basements of the buildings. The boys also distributed large quantities of poison to all the drug stores in the city, and the store-owners, in turn, cooperated by seeing that all individuals and institutions were supplied, upon request, with sufficient poison to exterminate the rats on their premises.

One feature of the campaign which accomplished some particularly good results was the Boy Scout contest, in which prizes were presented to the troops whose members collected the largest number of rat tails. The tails were all brought to the local fire stations, and through the courtesy of Fire Chief Price, the firemen were assigned the task of keeping a record of the tails collected by the various troops. The unusual nature of the contest aroused a lively interest among the boys, and a total of 10,847 tails were collected.

CLINT WOODBECK,
Editor, *The Flint Commercian.*

ANTI-RAT FILM

"The Modern Pied Piper," a two-reel motion picture portraying in detail a city-wide anti-rat campaign, has just been released by the United States Department of Agriculture. It will be distributed through the educational film service of the Department and the cooperating state institutions. Copies may be borrowed for short periods or may be purchased at the laboratory charge.

The City's Legal Rights and Duties

Conducted by A. L. H. Street, Attorney at Law

Right of Cities to Delegate Licensing Powers

AS an incident to the principle that a "public office is a public trust," appears the general rule that municipal legislative power cannot validly be delegated by the officials in whom it resides to others. Numerous are the cases in which courts of last resort have been called upon to consider whether licensing ordinances were or were not invalid as providing for unauthorized delegation of power. A reference to some of these cases will serve to at least roughly outline the law of the subject.

It is generally held that if discretionary power is vested in an administrative officer under a licensing ordinance, there must be some sort of definite rule of action to limit exercise of the power to reasonable bounds. The rule is well illustrated by the observations of the Massachusetts Supreme Judicial Court in a case where an ordinance forbidding occupation of a building in picking, sorting and storing rags, without a permit from the chief of the fire department, was held to be void (Commonwealth vs. Maletsky, 89 Northeastern Reporter, 245:

"Sections . . . of the ordinance before us, the validity of which sections is not brought in question, have provided for the materials and construction of buildings to be used for this business. Can the city of Chelsea also forbid any one from using for this purpose a building constructed in exact conformity with its requirements, unless he shall also have procured a written permit to do so from the chief of its fire department? The effect of this additional requirement is to leave it wholly to the will of that officer whether or not any person shall be permitted to engage in this business. No rules are provided for the exercise of his judgment. . . . Doubtless it is to be expected that a subordinate officer intrusted with such unlimited power will use it wisely and with a view only to the public good; but . . . there is nothing in the ordinance to guide him in passing upon the applications that may be made to him."

So, too, the Louisiana Supreme Court ruled that an ordinance forbidding operation of dairies within municipal limits without a permit from the council was held to have been vitiated because:

"It is within the power of the city council to grant the privilege to some, to deny it to others. The discretion vested in the council is purely arbitrary. It may be exercised in the interest of a favored few. It may be controlled by partisan considerations and race prejudices, or by personal animosities." (State vs. Mahner, 9 Southern Reporter, 480.)

The same reasoning has been followed by other courts in annulling ordinances; for example, by the Maryland Court of Appeals in holding that unrestrained power could not be granted to the mayor to revoke permits for operation of steam engines (Baltimore vs. Radecke, 49 Maryland Reports, 217.) A Denver ordinance, giving the city health commissioner arbitrary right to determine whether license to operate a butcher shop should issue, was likewise decreed to be void. (Walsh vs. Denver, 53 Pacific Reporter, 458.)

A generally recognized rule of law that charter authority vested in a city council to fix license fees or taxes cannot be delegated to an administrative official was followed by the Washington Supreme Court in the case of State vs. Scott, 196 Pacific Reporter, 576. It was decided in that case that an ordinance purporting to forbid peddling without obtaining a license was void where it required payment of such license fee as the commissioner of public safety should deem suitable and proper, not less than $1. Approving the reasoning of the Courts of New Jersey and Indiana in similar cases, the Washington Court observed that:

"The power to grant licenses and to fix the amount thereof having been reposed in the city council, that body had no right by ordinance to delegate this authority to the commissioner of public safety who, as such officer, in granting of the license and fixing the fee would act in an administrative capacity." In the Indiana case (Bills vs. City of Goshen, 20 Northeastern Reporter, 115), the Supreme Court of that state said that it was "material to the validity of an ordinance that a fixed and definite license

fee should be named in the ordinance, which all persons engaged in like business shall pay."

But the Georgia Supreme Court has decided that an ordinance empowering officials to grant or refuse licenses for the operation of hotels, lodging-houses, etc., was not invalid because it did not expressly prescribe a rule of action. (Cutsinger vs. Atlanta, 83 Southeastern Reporter, 263.) The Court held that there was an implied duty on the part of the officials to use reasonable discretion. And the Appellate Division of the New York Supreme Court sustained the validity of an ordinance of the city of Buffalo giving broad discretion to administrative officials in the matter of granting licenses for the sale of meat. The Court said:

"It will be observed that in some of the cases adverted to, the test upon which the discretion of the mayor was to be exercised was defined in the act or ordinance creating the authority, while in others there was no limitation placed upon it. It does not follow that the omission to prescribe the bounds of authority carries the conclusion that it is vested arbitrarily in the official or body to whom it is committed. The difficulty of defining in a given case what standard shall be applied in the disposition of the petition, and the fact that the conservation of the public health is the basis for the existence of the authority, indicate the reason for the absence of definition; but it is no warrant for the inference that the power is an arbitrary one, to be exercised in ruthless disregard of the rights of any class or individual. The discretionary authority must rest somewhere, and experience has proven that its lodgment in some body or official of the municipality is more efficacious than to leave it with the legislature, to whom the local situation may be unknown." (Buffalo vs. Hill, 79 New York Supplement, 449.)

In the case of Gundling vs. Chicago, 177 United States Reports 183, the highest court of the land upheld an ordinance of the city of Chicago, conferring discretionary power on the mayor to determine whether an applicant for license to sell cigarettes was of good character and bore a good reputation. But the measure was treated as valid on a theory that the mayor was legally bound to grant a license to every applicant who fulfilled the qualifications of good character and reputation.

Sundry Items of Municipal Law

Restriction on Sunday Restaurant Operation Annulled

An ordinance of the town of Landis, N. C., was declared by the Supreme Court of the state to be invalid in so far as it purported to prohibit serving of meals by a restaurant owner on Sunday. (State vs. Blackwelder, 120 Southeastern Reporter, 196.) The Court held that the ordinance was unreasonable, oppressive and in derogation of common right.

Power to Condemn Dilapidated Buildings

Charter power vested in a city to declare to be nuisances wooden buildings within established fire limits when the same are dangerous to near-by buildings does not justify condemnation of a building on the mere ground of its being dilapidated, according to the decision of the Texas Supreme Court in the case of Crossman vs. City of Galveston, 247 Southwestern Reporter, 810.

Where Statute Authorized Board or Officer to Make Sale, City Held Powerless to Employ Auctioneer to Sell Property

According to a decision of the Ohio Supreme Court, a statute authorizing a board or officer to sell real estate belonging to the city impliedly requires the sale to be made directly by the board or officer, and does not justify employment by the city of an auctioneer for the purpose. (State vs. Carrel, 132 Northeastern Reporter, 161.)

Right to Enjoin Dance Hall Operation as Being a Nuisance Upheld

In the case of Parker vs. Trueheart, 246 Southwestern Reporter, 428, the Texas Court of Civil Appeals held that a temporary injunction was properly issued to restrain operation of a dance hall within ninety feet from plaintiff's house. It appeared that from 100 to 250 persons patronized the hall each evening, disturbing near-by residents in the enjoyment of their homes from 8 until 11:30 o'clock, and that intoxicated persons congregated in the neighborhood as an incident to the operation of the place.

Municipal Obligations Cannot Be Avoided by Reincorporation of the Municipality

The incorporation of a municipality by legal procedings does not void its legally subsisting contracts, but on the reincorporation of the same inhabitants, and of a territory including street improvements for which bonds were given, the obligation to pay them devolves upon the new corporation. A statute making a vote of taxpaying voters necessary to the assumption of a new municipality of a debt of its predecessor, which has been abolished, is an unconstitutional attempt to impair the obligation of the contract, if a liability existed without such vote before the statute. (North Carolina Supreme Court, Smith-Courtney Co. vs. Board of Road Commissioners of Hertford County, 108 Southeastern Reporter, 443.)

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Zoning Notes

Prepared by Frank B. Williams

Author of "The Law of City Planning and Zoning"

From data collected by the Zoning Committee of New York (233 Broadway), and from other sources

For further information, Mr. Williams may be addressed in care of
THE AMERICAN CITY MAGAZINE, 443 Fourth Avenue, New York

Recent Zoning Ordinances

CAMBRIDGE, MASS.—Ordinance, January 7, 1924.

LONGMEADOW, MASS.—Ordinance, October 3, 20, 1922.

Recent Zoning Decisions

CALIFORNIA.—Miller v. Board of Public Works of City of Los Angeles, District Court of Appeal. This case was commented on in the February "Zoning Notes." At that time the opinion, since received, was not at hand.

The plaintiff is the owner of a lot zoned as residential. Under the first of two ordinances here referred to, residences designed for any number of families were allowed on the lot in question, and the plaintiff applied for and obtained a permit for the construction of a four-family house. This permit was cancelled on the ground that the City Council had ordered its revocation for the reason that it was about to pass an ordinance which would prohibit the erection of flats in that district. Thereupon, on September 1, 1921, this action was brought to compel the issuance of the permit. On September 6, 1921, an emergency ordinance was enacted allowing only residences for not more than two families to be constructed in the district. The questions of the defendant's power to revoke a permit once issued, and to pass an ordinance of this nature to operate retroactively, are not, however, raised; the sole question argued being the constitutionality of a regulation creating residential districts, from which four-family houses are excluded. As stated in the February issue, the case holds that the regulation in question is not a proper exercise of the police power, since four-family houses are not necessarily a menace to the public health, safety or general welfare. The bulk of the opinion is a clear exposition of this proposition. There are also dicta seeming to imply that stores and similar activities cannot be excluded from residential districts, but only nuisances; the Court citing and either distinguishing or declining to follow the numerous decisions to the contrary. The case has been appealed.

NEW YORK.—Lourose Realty Corporation v. Putnam, Special Term, Supreme Court, reported in *New York Law Journal*, December 7, 1923, page 847. Defendant asked for a permit for the construction of a number of separate buildings each arranged for garages for five or less cars. Plaintiff seeks to restrain their completion. Motion denied. If defendant intends to rent the separate buildings to individuals for use in good faith as tenants, although defendant intends to control and manage the runways and have a man clean cars for the tenants, and operate a central heating plant, that would be no violation of the zoning regulation. But if defendant directly or indirectly proposes to operate and control the buildings for his own use and let out space for automobiles as is ordinarily done in a public garage, then he would be violating the spirit if not the letter of the regulation. He would in that case be circumventing the purpose of the statute; for the separate buildings would be virtually one building with partitions between. The real situation will be disclosed at the trial. Even if it did clearly appear that the defendant intended to use the premises in violation of the zoning regulation, the erection of the buildings would not be restrained, because a lawful use of them might be made; nor does the plaintiff show the damage to himself necessary for him to sustain this action, in a matter in which, primarily, the duty of enforcing the law rests with the public authorities.

Municipal Gas Co. v. Nolan, Superintendent of Bureau of Buildings, City of Albany, 201 New York Supplement 582 (August 21, 1923). Where a building superintendent refused to examine plans for the construction of a gas-tank, and refused to issue a permit therefor on the ground that a city ordinance prohibited the construction of gas-tanks within the city limits, there was a refusal to act, and no determination for review to vary and modify the strict requirements of the building ordinances in cases of unnecessary hardship, or by certiorari; and mandamus was the proper remedy.

Under Laws 1921, Sec. 221, establishing a board of appeals to review the determinations of the superintendent of buildings, and vary and modify the strict requirements of the building ordinance in cases of unnecessary hardship, the board has no power to pass upon the constitutionality of a city ordinance.

An ordinance prohibiting the construction of gas-tanks within the city limits was unreasonable and arbitrary and therefore unconstitutional.

Where in a mandamus proceeding, the Court determined that such an ordinance was unconstitutional, a motion restraining the city officials, who had previously enforced the ordinance, from interfering with the construction of the tank, will be denied, where it is not likely that the officials will ignore the mandamus order.

The 1924 Autocar Line

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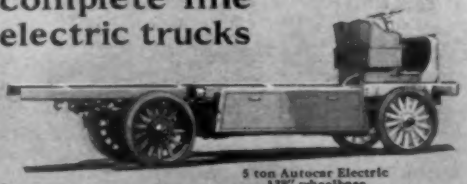
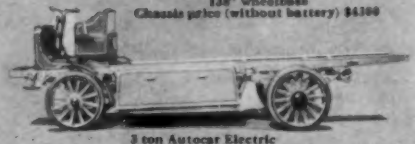
2 to 3 ton gas Autocar
114" wheelbase
Chassis price, $3450



5 ton Autocar Electric
138" wheelbase
Chassis price (without battery) $4300

2 to 3 ton gas Autocar
138" wheelbase
Chassis price, $3850

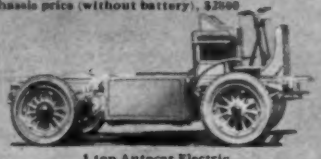


3 ton Autocar Electric
126" wheelbase
Chassis price (without battery), $3200

4 to 6 ton gas Autocar
120" wheelbase
Chassis price, $4650

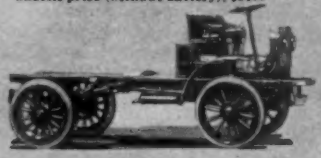
3 ton Autocar Electric
126" wheelbase
Chassis price (without battery), $3800

4 to 6 ton gas Autocar
136" wheelbase
Chassis price, $4800



1 ton Autocar Electric
107" wheelbase
Chassis price (without battery), $3400

4 to 6 ton gas Autocar
192" wheelbase
Chassis price, $5200



1½-2 ton gas Autocar
97" wheelbase
Chassis price, $2200

The Autocar Company, Ardmore, Pa.

ESTABLISHED 1897

Branches in 46 Cities

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gas *and* electric trucks

EITHER OR BOTH - AS YOUR WORK REQUIRES

It should be noted that this case, although not interpreting a zoning ordinance, has a bearing upon zoning in many of its phases.

OHIO.—Ambler Realty Co. v. Euclid Village, U. S. District Court, Northern District of Ohio, Eastern Division, January 14, 1924. The decision in this case, mentioned in February "Zoning Notes," is now at hand. The facts seem to be substantially as stated in our February issue. They seem to show that the regulations, as applied to the areas in question, were unreasonable. The Court reviews the zoning and other more or less relevant cases at length, and takes occasion to state that, in its opinion, zoning, in most of its phases, is unconstitutional.

An interesting variation in the forms of zoning regulations is to be found in the Cambridge ordinance, noted in this issue of the "Zoning Notes." It consists in the enactment of the zoning provision and the building code, usually separated, as one ordinance. While there are advantages in this form of enactment, it should be remembered that there are substantial differences in the two classes of provisions which must be kept in mind, in order that procedure applicable in one case may not be applied in the other.

The Municipal Bond Market

By Sanders Shanks, Jr.
Editor, *The Bond Buyer*

THE threat of income tax reduction has not damaged the municipal bond market. The Mellon tax bill would decrease the tax-exemption value of state and city bonds by lowering rates, especially those in the high-income brackets. So would the substitute proposals which have been offered, although to a less extent. The bond market, however, reflects the belief of investment bankers and tax-exempt bond buyers that Mr. Mellon's program is not going to be enacted into law at this session of Congress.

During the month of January and the first two weeks of February about $145,000,000 new issues of state and municipal bonds were underwritten by the investment houses specializing in tax-free securities. During the same period, it is estimated that investors absorbed between $75,000,000 and $100,000,000 worth of tax-free bonds. While it is true that the shelves of the dealers in state and city bonds are at this time well stocked, it is also a fact that comparatively little new financing is in view during coming weeks. Bonds of this class are being absorbed by institutions and private investors at prices yielding from 4 per cent for the highest-grade legal savings bank bonds, to 5 per cent or more for the western and southern county district and small-town issues.

Compared with the latter part of 1923, municipal bond prices have advanced slightly. But a study of bond-market averages, tracing the course of prices of railroad, public utility, industrial and municipal issues since January 1, 1923, discloses the fact that the price spread between tax-exempt municipals and taxable railroad and other private corporation securities has been considerably reduced.

The recent new public financing brought to the attention of investors embraces many important offerings of state, city and county bonds.

IMPORTANT MUNICIPAL BONDS SOLD DURING FEBRUARY

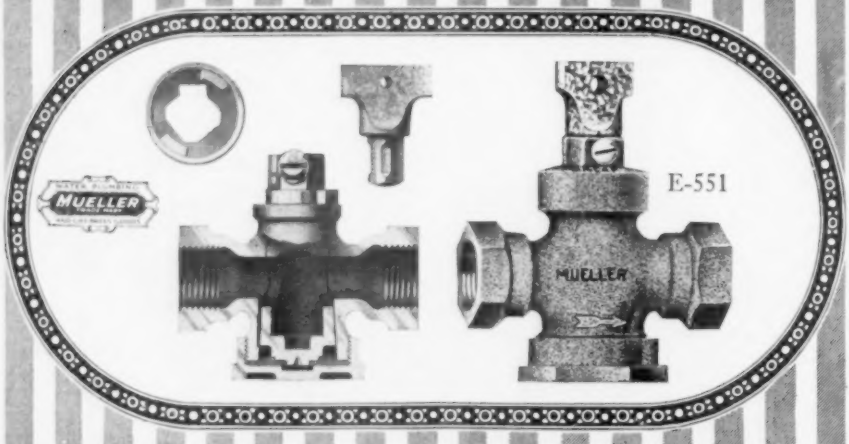
Amount	Borrower	Maturity	Coupon Rate (%)	Net Yield (%)
$12,000,000	Philadelphia, Pa.	1974 opt. 1944	4¼	4.18
10,000,000	Minnesota	1944	4¼ & 4¾	4.52
3,000,000	Porto Rico	1944-49 opt. 1943	5	4.63
1,000,000	Toledo, Ohio, Sch. Dist.	1924-48	5	4.64
2,000,000	St. Louis, Mo.	1929-44	5	4.76
11,000,000	Los Angeles, Calif.	1925-64	4½ & 5	4.88
1,260,000	El Paso Co., Texas	1954 opt. 1939	5	5.00
3,000,000	South Dakota	1934-44	5 & 5¼	5.02

Newspapers Conduct National Oratorical Contest

TO increase interest in and respect for the Constitution of the United States, about 200 newspapers throughout the country are cooperating in conducting a nation-wide oratorical contest among secondary-school students. The contest calls for original orations, requiring not more than twelve minutes each for delivery, on one of the following subjects:

The Constitution, Washington and the Constitution, Hamilton and the Constitution, Jefferson and the Constitution, Madison and the Constitution, Marshall and the Constitution, Webster and the Constitution, Lincoln and the Constitution.

For the purpose of this project, the country has been divided into seven zones. The selection of winners will proceed by classes, schools, groups of schools and major newspapers' territories until the winner in each zone has been determined. These seven winners will then compete in Washington on June 6, 1924, for the three national prizes for $3,500, $1,000 and $500. Further details as to the contest may be had upon request from Randolph Leigh, Director, National Oratorical Contest, Room 1012, Pulitzer Building, New York City.



The "Time-Test" of Underground Work

Durability and freedom from expensive repairs is the "time-test" of underground work. For this reason, many water-works companies specify Mueller equipment throughout.

Note carefully the construction of the Mueller Curb Stop No. E-551 shown above. The key is tapered toward the top, and cannot set or stick under the weight of the rod.

MUELLER
Inverted Key Curb Stops

are so built that the water is forced beneath the key through the by-pass on the inlet side—thus forcing the key up and holding it tight to its bearings.

The patent cap prevents dirt from working down and causing a leak, or interfering with the perfect opening or closing of the stop. Each stop is thoroughly tested under 200 pounds hydraulic pressure, and is fully warranted.

Write for detailed descriptions and prices in any quantity.

Mueller Co., Decatur, Illinois, U. S. A.

145-149 W. 30th St., New York; 1072-76 Howard St., San Francisco; 2468 Hunter St., Los Angeles

From the International Union of Cities

Announcement

READERS of THE AMERICAN CITY will recall that several months ago some account was given in these pages of the formation in Brussels, in 1920, of what is known as the International Union of Cities, an organization to collect and study contemporaneous documentary information of all kinds relating to civic affairs, to supplement this research work by the preparation of briefs or short reviews, and to distribute these, carefully and systematically classified, as promptly as may be throughout the civilized world. With headquarters in Brussels and "Centers" formed or forming in all important countries, this project is now well under way, particularly as far as Europe is concerned, and is proving itself an instrument of great value to progressive city officials and students of civic affairs.

A committee of the American Society of Landscape Architects,* whose efforts have been endorsed and aided by several other national organizations interested in civic advance, has been at work upon the project of establishing in Washington, D. C., an American Center of Civic Documentation, to be affiliated with the European organization, thus not only giving our progressive cities the benefit of the invaluable data they are collecting and distributing, but furnishing them with worth-while material of this sort from America. Various means of accomplishing this purpose have been proposed and rejected; but what is expected before many months to prove a practicable method of solving the problem is now being worked out. In the meantime THE AMERICAN CITY is glad to be able to cooperate with this committee in publishing a few columns of the sort of data now being regularly disseminated throughout Europe—a sample or foretaste, so to speak, of what may be expected when the proposed Washington "Center" is fully developed.

It will be noted that while these briefs or items are first classified under such general headings as City Planning, Housing, Water-Supply, Sewage and Sewage Disposal, Refuse-Removal, Light, Heat, Power, Transportation, Public Health Administration, Education, and so on, each brief is also numbered (at the top) in accordance with the well-known Dewey decimal classification system. By this means, without having to reread each item, any official or specialist can automatically, by a simple grouping of numbers in their decimal succession, assemble collections of subjects of one class very easily and very completely—much better than would be possible by a classification under brief title or heading, particularly as the notes are taken from the literature of all languages. In order to facilitate this clipping and filing, the items are printed on one side only of the page and therefore it will be an easy matter to keep one's data constantly up to date in whatever branches of the broad field there may be particular interest.

But the Brussels office does not limit itself to this careful study, briefing and publication of current civic documentation data; it has on hand a very complete file of all the material from which these briefs have been prepared, and is therefore ready, at slight expense and short notice, to supply those desiring it with more detailed information—complete reports or special articles, for example, or with photographs or photostat reproductions, copies of plans and other details. It is suggested that, in requesting additional data, readers identify the particular subject by use of the item number which appears at the *end* of each paragraph.

71 (43.21)
CITY PLANNING. Saxony, Germany.

A City Planning Seminary.—A City Planning Commission for the Free State of Saxony has been founded at Dresden, and has become an organized part of the free Academy of City Planning of Berlin. This has for its object the bringing together of all who are occupied with either the scientific or the more practical phases of city planning, in order to permit them to become familiar with the progress of all projects in the domain of city planning, to encourage good tendencies, to combat errors, and to make known to all the progress of the science and art of city planning. I. No. 278

71.31 (42.72 B.)
TOWN PLANNING. Lancashire, England.

Extension of the Seashore of Blackpool.—Thomas Mawson of London has prepared an excellent plan with perspective showing the improvement of the southern portion of the well-known health resort. The plan, which includes an area of 100 acres, has been treated as a rich residential quarter, with business and commercial centers, churches, hospitals, playgrounds and gardens. The famous promenade will be extended, sheltered by the breakwater which is now being constructed. The proposed marine gardens will be established behind these in order that they may be sheltered from the high winds. I. No. 281

71.313 (42)
GARDEN CITIES. Holland.

A Garden Village at Het Gooi.—The city of Amsterdam has named an investigation committee with the object of creating a garden city or garden villages, to be situated some distance from the capital, either in Het Gooi or elsewhere. The commune of

*The special committee referred to is known as Standing Committee of the American Society of Landscape Architects to Cooperate with the International Union of Cities and its Centers of Civic Documentation. Its members are: Stephen Child, Chairman; Professor James Sturgis Pray, Chairman School of Landscape Architecture and City Planning, Harvard University, and Frederick Law Olmsted, Past President, A. S. L. A.

Get Ahead—
Put Your Roads in Shape Now!

RIGHT now is the time to get busy on road repairs. Don't wait for summer weather. Avoid the delays of former years. Get after these holes, humps and hollows early—right *now*.

"Tarvia-KP" is the universal patching material — good for every type of road. "Tarvia-KP" is liquid, easy to handle and apply, not injured by freezing weather and no special equipment is necessary. Patches made with "Tarvia-KP" are dense, durable, and form a perfect bond with the road.

Our nearest office will upon request send you an illustrated booklet showing each step in patching with "Tarvia-KP."

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For Road Construction Repair and Maintenance

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Youngstown, Milwaukee, Toledo, Columbus
Baltimore, Syracuse, New Orleans, Rochester

THE BARRETT COMPANY, Limited: Montreal, Toronto, Winnipeg, Vancouver, St. John, N. B., Halifax, N. S.

Het Gooi has not been invited to set forth its wishes before this commission, and it has protested against the creation in the country of a working man's town, which will depend directly upon Amsterdam.

I. No. 282

71.5 (42.67 S.)

HIGHWAYS. **Essex, England.**

Projects for the Replanning of Southend-on-Sea.—An illustrated report has been prepared giving details of four city planning projects, which together cover a total area of 2,430 hectares. The projects include, beside the establishment of the new main artery from London to Southend, two other roadways 30 meters in width at each side of this main roadway. The purpose of these is to divert to the east of the town a part of the London traffic. The breadth of the highways projected will vary from 11 to 35 meters between sidewalks. The broad streets will be established in the form of boulevards and will be a great improvement to such a locality as Southend. The minimum distance between building lines is 20 meters; 220 hectares are reserved for parks. I. No. 285

71.5 (43.515)

HIGHWAYS: APPEARANCE OF THE STREET. **Hamburg, Germany.**

Proposed Building Law for Hamburg.—A law will soon be enacted at Hamburg, taking away from the office of Building Construction (Baupolizei) the control of construction of buildings, in order to grant this to a council to be formed of members of the Hamburg Senate and of citizens completed by a Council of experts. This Council will have power to oppose its objections to disfigurations of the streets by inappropriate building constructions, and also by unfortunate advertisements. I. No. 286

71.5: 62.5 (944)

BRIDGES. **Australia.**

A Bridge with a Span of 1,650 Feet.—At Sydney, they are about to commence the foundations of a bridge with a span of 1.650 feet, which will be the longest bridge of this sort. The bridge will join together the city of Sydney and its suburb, Milson Point. The cost of the project, the execution of which will probably take six years, is estimated at 7 million pounds sterling. The authorities of Sydney demand from the contractor a guarantee of 250,000 pounds sterling, a sum which will be paid back when the work has been completely accomplished. I. No. 287

71.6

PLAYGROUNDS. **Germany.**

The Laying Out of Athletic Fields and Playgrounds.—A German expert maintains that in order to respond to the modern needs of athletic fields and playgrounds, it is not necessary to limit one's self to the laying out of these places, but rather to realize at the same time verdant conditions: (1) the ancient parks and verdant open spaces, with a character purely decorative, may be transformed for the use of young people and to the profit of public health; (2) playgrounds and athletic fields, the technical purpose of which does not demand a framework of verdure, should be enhanced by gardens in order to permit a happy disposition, recalling the most beautiful parks of cities.

I. No. 292

33.332 (492)

HOUSING. **Holland.**

Extension of the Amortization of Loans.—A Dutch expert recalls numerous propositions of administrators of building associations, their effect to extend from 50 to 75 years the period of amortization in order to reduce the charges of exploitation, and consequently the relatively high rents. The author proves by examples that the reduction of rents thus obtained is insignificant. Furthermore, the recent buildings grow old relatively quickly; it is important then to amortize them in 50 years rather than 75.

II. No. 393

33.41 (494.34)

BUILDING COOPERATIVE SOCIETIES. **Zurich, Switzerland.**

The Activity of a Building Cooperative Society at Zurich.—The construction of ten houses with multiple apartments, including 22 lodgings of 4 rooms each, and 34 lodgings of 3 rooms each, ready to be occupied. Two other projects are under construction. The Cooperative Society has completed altogether in the past few years 240 lodgings in various parts of the city. II. No. 396

72.811 (43.36)

HOUSING. **Upper Bavaria, Germany.**

Types of Houses of the Building Society "Brannenburg" in Upper Bavaria.—Interesting types of houses termed "Brannenburg" have been erected by a Construction Society at Brannenburg, Upper Bavaria. The plans are characterized by an economic and appropriate distribution, by a possibility of large application of the principle of standardized parts, by an economy of time in construction, by a perfect utilization of material, etc. Standardization is carried to the limit, but this does not interfere with the satisfactory appearance of the types of houses; they comply with local forms of construction. II. No. 407

72.811 (43.47)

HOUSING. **Wurtemberg, Germany**

Typical Plans of Workmen's Houses.—The Committee of the Council of the Building Industry of the Office of Wurtemberg, at Stuttgart, has published in the edition "Eugen Wahl, Stuttgart," an important collection of 27 typical plans of workmen's houses. The practical utility of this consists in the fact that one may rapidly (being given a building site) judge of the economy of each one of the typical plans applicable to the conditions of the topography and orientation. No. 408

The Bear Tractor

Speed–Quick Turning–Easy Control —These You Need for Road Patrol —And These You Have in the Bear

AS ONE man said, "It seems the Bear is *specially made* for nearly *every* job." The truth is, practically *every* feature in the Bear is of advantage in *every* kind of tractor work. So, while the Bear is termed a *universal* tractor, most Bear owners feel that it was designed *especially* for them.

And nowhere is this feeling more pronounced than among the men who are doing road patrol work. If all your other tractor work were eliminated from consideration, it is doubtful if a better tractor could be built at the present time for road patrol.

Not only is the Bear *fast,* not only is it *quick at the turn,* not only is it *easy to control*—but it supplies *cheap* power, whether pulling a half load or a full load. Its power flexibility, its efficiency in delivering its power to the drawbar, its economy in fuel and oil consumption, its low upkeep as illustrated in the track—these are some of the reasons *why* the Bear supplies cheap power for road maintenance.

It will cost you nothing to learn a lot more about the Bear Tractor. A book, just published, will be sent to you on request.

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The Tractor that Delivers its Power to the Drawbar

Municipal and Civic Publications

Prices do not include postage unless so stated

The Principles of Vital Statistics.—By I. S. Falk, Ph.D., Department of Public Health, Yale University. W. B. Saunders Company, Philadelphia. 1923. 258 pp. Charts, tables. $2.50.

A simple, clear and readable introduction to the subject of vital statistics. It describes the more important procedures and sources of information used in statistical inquiries, and gives outstanding evidences and conclusions of interest to workers in public health, cautioning the untrained statistician on certain essential points in the keeping of vital statistics.

Introduction to Medical Biometry and Statistics.—By Raymond Pearl, Professor of Biometry and Vital Statistics in the School of Hygiene and Public Health, and of Biology in the Medical School, the Johns Hopkins University. W. B. Saunders Company, Philadelphia. 1923. 379 pp. Illustrated. $5.00.

Written for the medical reader primarily, and showing how he may find the point of view of biometry (the dealing with statistics derived from living things), and the application of modern statistical methods useful in drawing conclusions from his facts and in solving problems constantly arising in his work, which cannot be solved correctly without such methods.

Highway Engineering.—Proceedings of the Ninth Annual Conference on Highway Engineering, held at the University of Michigan, February 12-15, 1923. University Bulletin, October 27, 1923. The conference was held under the direction of the College of Engineering of the University, with the cooperation of the Michigan State Highway Department and the Michigan Association of Road Commissioners and Engineers. 244 pp. Views, charts, drawings, tables. Valuable information on the design, construction and maintenance of roads and highways and on highway bridge problems. (Apply to the College of Engineering, University of Michigan, Ann Arbor, Mich.)

Water Metering and Fire Prevention.—Address by Col. A. A. Sprague, Commissioner of Public Works, Chicago, at a City Club Forum meeting, October 11, 1923. 8 quarto pp. Stating that Chicago's daily water waste is equal to two-thirds of the entire amount pumped for Greater New York, and that, "properly meterized, the Chicago system will effect a minimum saving of $285,000,000 in the next twenty-five years." (Apply to the City Club of Chicago, 315 Plymouth Court, Chicago, Ill.)

Motor Bus Raises Educational Standards.—By J. F. Abel. Reprint from "School Life," November, 1923. 4 pp. Illustrated. Showing that school consolidation in rural districts gives country children school advantages equal to those of the city, and that good roads are essential in bringing this about. (Apply to the National Motor Truck Committee, National Automobile Chamber of Commerce, 366 Madison Avenue, New York, N. Y.)

The Proposed One Hundred Million Dollar Road Bond Issue for Illinois.—By Frank T. Sheets, State Superintendent of Highways. January 1, 1924. 21 pp. Charts, table. Analyzing the proposed bond issue from the economic and business standpoint. This matter will come up for ratification in November, 1924. (Apply to Clifford Older, Chief Highway Engineer, Division of Highways, Department of Public Works and Buildings, Springfield, Ill.)

Mortality Rates, 1910-1920.—Bureau of the Census report, published 1923. 681 quarto pp. Text, tables, charts. With population of the Federal Censuses of 1910 and 1920 and intercensal estimates of population. Prepared under the direction of Dr. William H. Davis, chief statistician for vital statistics, and under the immediate supervision of Richard C. Lappin, expert special agent of the Bureau of the Census. (Apply to the Government Printing Office, Washington, D. C.)

State Supervision of Municipal Indebtedness.—By Lane Lancaster. The University of Pennsylvania, Philadelphia, Pa. 1923. 108 pp.

A thesis in political science presented to the Faculty of the Graduate School of the University of Pennsylvania in partial fulfillment of the requirements for the degree of Doctor of Philosophy. The purpose of the study is to discover the extent to which our state governments have adopted real policies toward local indebtedness and the degree to which such policies conform to the true nature of the problem of the relation of principal and agent, which, in the opinion of the author, requires that the principal should (1) impose certain approved standards, and (2) create adequate machinery for enforcing compliance with such standards.

The Administration and Politics of Tokyo.—By Charles A. Beard, formerly Director of the New York Bureau of Municipal Research. The Macmillan Company, New York. 1923. VII + 187 pp. $2.50 postpaid.

This study of Japanese municipal government was carried on in Tokyo by Dr. Beard in the winter and spring immediately preceding the earthquake. It was undertaken at the request of Viscount Goto, who was then Mayor of Tokyo, and who summoned Dr. Beard again, as the representative of the Bureau of Municipal Research, six days after the earthquake. It has been made evident that the usefulness of the survey has not been nullified by the disaster, and that there is now room for a new and adequate administration of city affairs such as this volume outlines.

Survey of City and Regional Planning in the United States, 1923.—By Theodora Kimball, Librarian, School of Landscape Architecture, Harvard University, Cambridge, Mass. With a list of plan reports 1922-1923. Reprinted from "Landscape Architecture," January, 1924. 16 pp. Covering recent news from nearly 250 cities in 42 states and the Territory of Hawaii on notable achievements, legislation, and general progress in city and regional planning and zoning, including improvements in street systems, the promotion of parks and civic centers, and the study of rapid transit, railroad terminals and port development. This survey should make a strong appeal to town and city officials and state legislatures to realize and use their present opportunities of controlling future development. (Apply to author.)

Character Education Methods.—The Iowa Plan ($20,000 Award, 1922). Published by the Character Education Institute, Chevy Chase, Washington, D. C. A business man known in this connection only as "The Donor," offered to state groups of research educators, through the Executive Committee of the Character Education Institution, a $20,000 prize for the best public-school method for character education of children and youth. Only 26 states worked out plans for submission. Iowa's group won the award, with the plan presented in this pamphlet, 5,000 copies of which are being published at the expense of The Donor for free distribution in order to secure criticism and advice. (Apply to the Character Education Institution.)

Chicago Firemen—Their Efficiency and Compensation.—Submitted by the Firemen's Association of Chicago, Local No. 2, as a report regarding their request for an increase in salaries. November 30, 1923. 27 pp. Charts and tables. Prepared by The Labor Bureau, Inc., 440 S. Dearborn Street, Chicago, Ill. (O. Zimrring). (Apply to the Bureau.)

How to Guard Against Crime.—Issued by Richard E. Enright, Police Commissioner, New York City. 16 pp. Pocket size. A list of "Don'ts" for householders and others, at home or in public places, and for banks, in order to protect property and life and to apprehend dishonest persons. (Apply to the Commissioner.)

for the Spring Rush

"We telephoned you a rush order for a tractor to be used on a particularly 'tough' strip of grading, ripping up an old macadam road,"

writes an owner of a Best "Sixty."

"NOW—we would not be without it for twice the price."

If you have rush work ahead of you this spring, *investigate the reputations which Best "Thirties" and "Sixties" have made for getting tough jobs done on time!* A list of nearby owners will be sent on request.

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27-324

BEST TRACTORS

The Municipal Budget.—Publication No. 1 of the League of Minnesota Municipalities. 24 pp. November, 1923. Presenting briefly the contents of a municipal budget and the method of procedure in preparation, with forms for budget statements. Written primarily as offering suggestions for those officials that are contemplating a budget system and do not know how to proceed. (Apply to Morris B. Lambie, Executive Secretary, League of Minnesota Municipalities, University of Minnesota Library, Minneapolis, Minn.)

Housing Problems in Relation to Industry.—By Bernard J. Newman, Managing Director, Philadelphia Housing Association. 4 quarto pp. in "Engineers and Engineering," published by the Engineers' Club of Philadelphia, 13-15 Spruce Street, Philadelphia, Pa. Illustrated. Showing the effect of home life and environment on the will to produce and the capacity to work, and presenting a survey of the housing conditions of Philadelphia workers and the great need of betterment. (Apply to the publishers.)

Better Homes in America.—How to Organize the 1924 Campaign. Guidebook for Demonstration Week, May 11-18, 1924. Publication No. 1 issued by Better Homes in America, an educational organization incorporated in the state of Delaware, 1923; national headquarters, 1653 Pennsylvania Avenue, Washington, D. C. 16 pp. Showing how to organize a Better Homes demonstration in your home town, and describing the prize-winning demonstrations of 1923. (Apply to the national headquarters.)

Guide for the Organization of Local Music Weeks.—In cooperation with National Music Week. Issued by National Music Week Committee, 105 West 40th Street, New York, N. Y. 30 pp. Music Week started as a city-wide rather than as a nation-wide observance and has already spread to 150 different cities and towns by its own momentum. The information in this booklet is of a general nature, designed to serve the average community. (Apply to the publishers.)

Housing and Regional Planning, New York State.—Report of Commission of Housing and Regional Planning to Governor Alfred E. Smith and to the Legislature of the State of New York on the present status of the housing emergency. December 22, 1923. Legislative Document (1924) No. 43. 102 pp. Embodying an examination into conditions in the cities to which the rent laws apply: New York, Albany, Schenectady, Amsterdam, Troy, Cohoes, Watervliet, Rensselaer, Buffalo, and Rochester, and showing that the housing emergency still exists in all of the cities examined except Rochester. George Gove is Director of Investigations. (Apply to Clarence S. Stein, Chairman of the Commission of Housing and Regional Planning, 949 Broadway, New York, N. Y.)

Zoning Law for Boston.—Preliminary Draft of Zoning Law for the City of Boston, Proposed by the City Planning Board. January, 1924. 23 quarto pp. Prepared for the Board by Arthur C. Comey, Zoning Director. Accompanied by "Outline of Proposed Zoning Plan for City of Boston" (9 mimeographed sheets) and "Summary of the Proposed Zoning Statute" (2 mimeographed sheets). (Apply to Frederic H. Fay, Chairman, The City Planning Board, 30 City Hall, Boston, Mass.)

The Charter of Denver, Colo.—"The Little Charter." A ready reference digest of the charter of the city and county of Denver. 1924. 23 pp. Printed under the administration of Mayor Benjamin F. Stapleton; compiled by E. C. MacMechen, Publicity Director. Prepared for the convenience of teachers and students of civics and members of local improvement associations, and covering all parts upon which the average citizen requires information, though not for attorneys or as a reliance in legal action; approved as to fact by the legal department of the city; containing also certain miscellaneous information for which there is a demand. (Apply to the Publicity Director.)

Pollution of Wells.—"The Principles Underlying the Movement of Bacillus Coli in Ground-Water, with Resulting Pollution of Wells." By C. W. Stiles, Professor of Zoology, Hygienic Laboratory, and Harry R. Crohurst, Sanitary Engineer, United States Public Health Service. Reprint, 1923, No. 844 from the Public Health Reports, June 15, 1922. 6 pp. (Apply to the Government Printing Office, Washington D. C.)

Police Statistics.—Tabulations made by the Bureau of Statistics and Municipal Reference Library, Chicago. 3 mimeographed sheets: Total Expenditures of Police Departments in 53 Cities of the United States, 1918-1921; Total Number of Arrests in 57 Cities 1918-1921; Strength of Police Forces in 43 Cities 1918-1921 and for the Period Ending June 30, 1922. (Send 5 cents postage to Frederick Rex, Municipal Reference Librarian, 1005 City Hall, Chicago, Ill.)

City Planning, Elizabeth, N. J.—Preliminary Report on the Elizabeth City Plan, by the City Plan Commission. 1923. 46 pp. Views, maps. Discussing the major problems which the city now faces, outlining the fundamental data necessary for dealing with them, and thus presenting the basis of a program to be elaborated. (Apply to the consulting engineers, the Technical Advisory Corporation, 15 Park Row, New York, N. Y.)

The City Manager Plan of City Government.—An explanation of what the city manager plan is, where it is used, and how it works. Published by The City Managers' Association. January 23, 1924. To be revised July 1, 1924. 32 pp. Containing the following: "Three Plans of Government"; "Where the City Manager Plan Is Used"; "How the City Manager Plan Works" (newspaper comments, letters from citizens); books and pamphlets on the city manager plan. 10 cents. (Apply to John G. Stutz, Executive Secretary, Lawrence, Kans.)

Why Tax Public Securities?—By John A. Lapp, LL.D. In "Public Ownership" for January, 1924, published by the Public Ownership League of America, 127 North Dearborn Street, Room 1439, Chicago, Ill. 10 pp. "The real meaning of the movement for a constitutional amendment to prevent tax-exempt securities." An address first delivered at the Public Ownership Conference at Toronto September 11, afterwards revised and given before the Chicago Public Ownership Lunch Club, December 27, 1923. (Apply to publishers.)

The City Manager Plan in Westerville, Ohio.—"Eight Years of Progress under the Manager Plan in Westerville." 7 pp. Published by Richard Biehl, City Manager, Westerville. January 23, 1924. Answering requests for information and giving details of the assets of the village. (Apply to the City Manager.)

Child Life and Play Space.—"An Opportunity for the Real Estate Men of the Country to Help Solve an Increasingly Serious Problem with Respect to Child Life and Play Space." By William E. Harmon. Pamphlet No. 198, published by the Playground and Recreation Association of America, 315 Fourth Avenue, New York, N. Y. 12 pp. Discussing the proposition of segregating for recreational purposes, say, 10 per cent of the land in any given subdivision. Arguments under three heads: cost in dollars or land to the owners; value to property so developed; the need and the value to the public. (Apply to the publishers.)

Parliamentary Debates.—Official Reports of the House of Commons and the House of Lords. Subscription rates for a complete session, usually one year, £3.10.0 and £2.15.0, respectively, postpaid. Individual copies, 7d postpaid. (Apply to Director of Publications, H. M. Stationery Office, Imperial House, Kingsway, London, W. C. 2, England.)

Recreation and Community Service, Houston, Tex.—Annual Report of the Department and Association for 1923, including the Leisure Hours Pageant, which was produced at the annual meeting to show the service rendered during the year. 20 pp. Illustrated. The Association supplements the work of the Department and receives its budget from the Community Chest. (Apply to Corinne Fonde, Executive Secretary of Association and Commission.)

Project for Lake Front Development of the City of Chicago.—By Eliel Saarin, Architect. In "The American Architect and The Architectural Review" for December 5, 1923. 29 quarto pp. Plans and drawings. A plan for development of Grant Park and its surroundings, "within the limits of the existing and the possible," preserving the landscape features of the park while making it a great through-traffic artery and a parking place. 50 cents. (Apply to the publishers, The Architectural and Building Press, Inc., Stamford, Conn.)

A Barber-Greene Clearing the Streets in Madison, Wis.

Clearing a city block in 15 minutes

In a recent snow-storm in Madison, Wis., a Barber-Greene Snow Loader cleared an entire block in 15 minutes, in some places plowing through drifts 5 feet high. This work would have required two hours for a large gang of men with ten wagons.

Eight of the recent Barber-Greene sales have been to towns ranging from 35,000 to 121,000 population.

This serves to show that the smaller cities, as well as the large ones, are realizing that the swift removal of snow is highly important to business.

From Manchester, N.H., a town of 78,000, the City Surveyor writes: "The machine is doing great work. The only people who are displeased are the one or two hundred shovelers it displaces."

From Duluth, Minn., the Commissioner of Public Works sends this report: "I am satisfied that we can keep our business section clear of snow and reduce our costs on snow removal with the new Barber-Greene. I might add that we loaded six yards of snow in one minute flat." Duluth is a city of 100,000.

In large cities and small, Barber-Greenes are doing away with the expense of large labor gangs, and are eliminating those tie-ups which have always been so costly to business.

Send for the book, "Mechanical Snow Handling," which describes the snow-fighting methods of a number of cities and street railways. And remember—last year the heaviest storms came in February and March.

BARBER-GREENE COMPANY—*Representatives in 33 Cities*—515 W. Park Avenue, Aurora, Illinois

BARBER GREENE
SNOW LOADERS

When writing to Advertisers please mention THE AMERICAN CITY—Thank you.

Estimates of Population of the United States.—By states and cities, 1910 to 1923, and area July 1, 1922. Prepared under the supervision of Charles S. Sloane, Geographer of the Census. 1923. Containing the estimates of population of the United States, the states and territories, counties, and the cities which had a population of 8,000 or more on January 1, 1920. For use by health officers in states which have an established system of registration of deaths, and by other statisticians who need population data for years subsequent to the census enumeration. 15 cents. (Apply to the Superintendent of Documents, Government Printing Office, Washington, D. C.)

Ten Addresses on Education.—By William L. Ettinger, Superintendent of Schools, New York City. Published November 12, 1923. 128 pp. The following are the subjects of the addresses: The Life Career Motive in Education; The Teacher and the Development of National Ideals; Americanization; Effective Supervision; Democratizing School Administration; Economy in School Administration; Facing the Facts; The Ethical Standards of the Teacher; Our Junior High School Problem; The American School Program from the Standpoint of the City. These addresses were delivered before associate and district superintendents of the New York City schools and other professional bodies. Apply to the Board of Education, Park Avenue and 59th Street, New York, N. Y.)

Standard Grading Specifications for Yard Lumber.—Recommendations of the Department of Agriculture. Prepared by Edward P. Ivory, Associate Wood Technologist, David G. White, Forest Examiner, and Arthur T. Upson, in Charge, Section of Industrial Investigations, Forest Products Laboratory, Forest Service. Department Circular 296. October, 1923. 97 pp. Many illustrations. Based on information collected during four years of study of this problem by the Forest Products Laboratory. 20 cents. (Apply to the Superintendent of Documents, Government Printing Office, Washington, D. C.)

Commentary upon the Comparative Tax Rates of 177 Cities, 1923.—By C. E. Rightor, Detroit Bureau of Governmental Research. Reprinted from the "National Municipal Review," December, 1923. 10 pp. Tables. Covering 165 cities of the United States and 12 cities of Canada having in excess of 30,000 population. Prepared with the purpose of making available a statement of the total tax burden upon property in each city, in terms of tax rates per $1,000 of uniformly assessed property. (Apply to the National Municipal League, 261 Broadway, New York, N. Y.)

Place of the Motor Coach in a General Comprehensive Plan for Transportation in Chicago.—Submitted by John A. Ritchie, President, Chicago Motor Coach Co.. May 15, 1923. 36 quarto pp. Map, views, charts. A survey of the broad problem of transportation and the type, quality and variety of service which the motor bus is prepared to render in this difficult situation. (Send 3 cents for postage to the Municipal Reference Library, 1005 City Hall, Chicago, Ill.)

City Planning in Buffalo, N. Y.—Second Annual Report of Chauncey J. Hamlin, President of the Buffalo City Planning Association, Incorporated, delivered at the meeting of the Corporation, December 5, 1923. In "City-Facts," published by the Association, January, 1924. 7 quarto pp. Summing up the accomplishments of the city in controlling its development, and presenting the program for the future, with methods of financing it. (Apply to the Association, 110 Delaware Avenue, Buffalo, N. Y.)

Constitutional Tax Exemption.—By Edward S. Corwin, McCormick Professor of Jurisprudence, Princeton University. A discussion of the power of Congress to tax income from state and municipal bonds. Supplement to "National Municipal Review," January, 1924. 20 pp. Maintaining that "What is needed is not further tinkering with the Constitution but an act of Congress assertive of its present powers." (Apply to the National Municipal League, 261 Broadway, New York, N. Y.)

Boston, Mass.—Ninth Annual Report of the City Planning Board, for the year ending January 31, 1923. (Apply to Frederic H. Fay, Chairman, The City Planning Board.)

Cook County, Ill.—Annual Message of Anton J. Cermak, President, Board of Commissioners of Cook County, for 1923. (Apply to the President of the Board.)

Fort Worth, Tex.—Annual Report of the Park Board for the year ending June 30, 1923. (Apply to George C. Clarke, Superintendent.)

Hartford, Conn.—Sixty-third Annual Report of the Board of Park Commissioners, and Fifteenth Annual Report of the Public Cemeteries, for the year ending March 31, 1923. (Apply to George A. Parker, Superintendent of Parks.)

New York, N. Y.—Report of Commissioners of Taxes and Assessments for the year ending March 31, 1923. (Apply to C. Rockland Tyng, Secretary.)

Philadelphia, Pa.—Annual Report of the Bureau of Water, for 1923. (Apply to Fred C. Dunlap, Chief of Bureau.)

On the Calendar of Conventions

MARCH 6-7.—FRENCH LICK SPRINGS, IND.
Indiana Sanitary and Water Supply Association. Annual meeting. Secretary, C. K. Calvert, 1902 North New Jersey Street, Indianapolis, Ind.

MARCH 27.—PUEBLO, COLO.
Colorado Municipal League. Annual convention. Secretary, Don C. Sowers, Boulder, Colo.

APRIL 3-5.—MINERAL WELLS, TEX.
Texas Commercial Executives' Association. Annual convention-school. Secretary, J. E. T. Peters, Ranger, Tex.

APRIL 7-10.—LOS ANGELES, CALIF.
National Conference on City Planning. Annual conference. Secretary, Flavel Shurtleff, 130 East 22nd Street, New York, N. Y.

APRIL 9-12.—ATLANTA, GA.
American Society of Civil Engineers. Spring meeting. Secretary, John H. Dunlap, 33 West 39th Street, New York, N. Y.

APRIL 15-17.—ATLANTA, GA.
Southeastern Water and Light Association. Annual convention. Secretary-Treasurer, W. F. Stieglitz, Columbia, S. C.

MAY 6-8.—CLEVELAND, OHIO.
Chamber of Commerce of the United States of America. Annual meeting. Secretary, D. A. Skinner, Mills Building, Washington, D. C.

MAY 7-8.—PARIS, TEX.
League of Texas Municipalities. Annual convention. Executive Secretary, Frank M. Stewart, Government Research Division, Bureau of Extension, University of Texas, Austin, Tex.

MAY 13-15.—ATLANTIC CITY, N. J.
National Fire Protection Association. Annual meeting. Secretary, Franklin H. Wentworth, 40 Central Street, Boston, Mass.

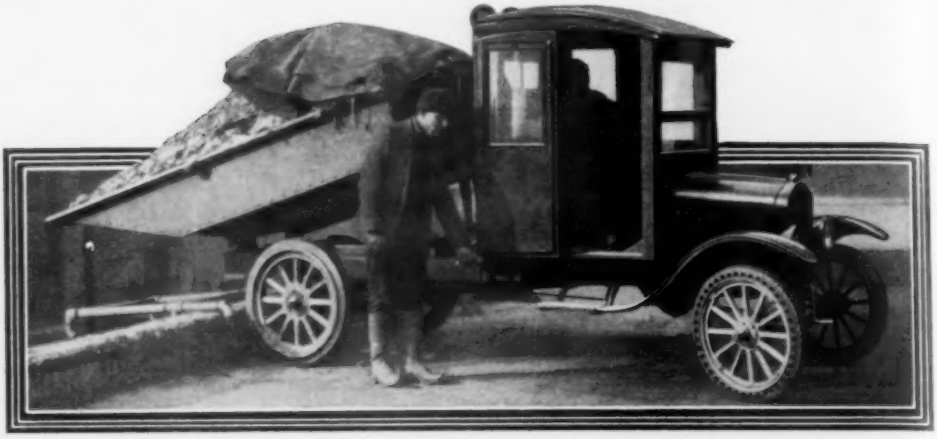
MAY 19-23.—ATLANTIC CITY, N. J.
National Electric Light Association. Annual meeting. Executive Manager, M. H. Aylesworth, 29 West 39th Street, New York, N. Y.

MAY 19-24.—NEW YORK, N. Y.
American Water Works Association. Annual convention. Address: W. M. Niesely, 153 West 71st Street, New York, N. Y.

MAY 21-23.—WASHINGTON, D. C.
American Institute of Architects. Annual convention. Executive Secretary, E. C. Kemper, The Octagon, Washington, D. C.

MAY 23-24.—MIDDLETOWN, OHIO.
Ohio Commercial Secretaries' Association. Annual meeting. Secretary, Avery G. Clinger, Assistant Secretary, Chamber of Commerce, Columbus, Ohio.

1924—BUFFALO, N. Y.
International Association of Fire Engineers. Annual convention. Secretary, James J. Mulcahey, Yonkers, N. Y. Date to be determined at Directors' meeting in Buffalo, April 15.



Fordizing Detroit's Public Works

The use of Ford Cars and Trucks and Fordson Tractors for a wide variety of public work by the city of Detroit is a first class example of Fordizing a municipality.

The fleet of 48 Ford Trucks covers the residential district collecting garbage. These trucks run sixteen hours a day, averaging six loads each, at a cost of $24.82 a day, including driver's and helper's wages. With 1500 collections daily, the cost is only 1.6 cents per collection, or 42 cents per month, per family served.

Ford One-Ton Trucks haul supplies for the Board of Education, Fire and Police Departments, Public Lighting Commission, Department of Parks and Boulevards, Department of Street Railways, Water Department—in fact haul materials of all kinds and descriptions for any municipal department at a lower cost than any other truck made.

Ford Cars are used by city inspectors and department superintendents.

For snow removal and general construction work on streets and boulevards, where every-day dependability counts, the Fordson Tractor has proved an ideal unit

Any Authorized Ford Dealer will be glad to help you work out your haulage problems.

To Fordize is to Economize

Ford

CARS · TRUCKS · TRACTORS

News and Illustrations

Items of Interest to City and County Engineers, City Managers, Water-Works Superintendents, City Controllers, Park Superintendents, Purchasing Agents, and Others Interested in the Economical Construction and Efficient Operation of Public Improvement Undertakings

Why Not Standardize Street and Road Markings?

By Lee Miller

Advertising Manager, The Tropical Paint & Oil Company, Cleveland, Ohio

Every year more motor vehicles are used in this country and, therefore, the regulation of this ever-increasing volume of traffic is becoming more and more of a problem. The great increase in the number of accidents is appalling, and anything that can be done to make motor travel safer is deserving of the most careful consideration. The traffic problem is by no means confined to the large cities, as the great amount of tourist travel in some parts of the country brings small towns and cities a volume of traffic that ordinarily would be found only in cities of considerable size.

A NEW METHOD OF CORNER MARKING, FOR USE WITH OR WITHOUT A POLICEMAN

One fruitful cause of accidents lies in the fact that tourists are not familiar with the many different markings and warnings that they find along their routes. At present, each town, county and state uses any marks that strike its fancy, and the result is that the tourist never knows just what he is expected to do, and frequently he does the wrong thing and meets with an accident.

Suppose, for instance, that there was a standard road marking in all parts of the country for approaches to railroad crossings, such as the series of warning lines that are used for this purpose in the state of New York. Then tourists running over unfamiliar roads at night would know when they saw these lines that they were approaching a railroad and would take the proper precautions. The same would be true of approaches to dangerous curves, steep hills, crossroads and other points where accidents are apt to occur. Standard markings for all these conditions would make automobile travel much safer than it is at present.

In cities, too, the tourist is often at a loss to know what to do. Perhaps he attempts to turn at a corner where traffic is not supposed to turn, and an accident results. It is not so much the fault of the tourist as it is the lack of standardization, which makes it almost impossible for him to know what to do. If such street crossings were marked in a standard way in every city in the country, then every driver of a motor vehicle would know that no turn should be made at a corner marked in that particular way. This is only an illustration of the many advantages of standardization.

As a step toward standardization, The Tropical Paint & Oil Company has just published a book showing blue-prints of the best street and road markings used throughout the United States. Before this book was printed, a great many different markings were studied and those that seemed to be the simplest and best were given a place in the book. Some special cases may come up that are not covered by any marking in the book, and later revisions will have to be made, but it is at least a start in the right direction. If you would like a copy, write to THE AMERICAN CITY. The illustration above shows one plan of marking which is explained in this book.

City, state and county officials who have charge of street and highway marking will do well to give some serious thought to this matter of standardization. It is one of the things which will be of help in combating the increasing danger of accidents on our streets and highways and, therefore, is highly important.

Safeguard the City's Buildings, the Grounds and the Children with a Stewart Chainlink Protection Fence.

STYLE NO. OT266—All Galvanized

Protection - Beauty - Permanence

THE advanced ideas in construction of the Stewart type of Chainlink Protection fence makes it the ideal fence for municipal water works, sewage disposal plants, parks, playgrounds, golf courses, tennis courts. Made of genuine open-hearth galvanized fabric with interlocking mesh; fittings of pressed or forged steel, it combines protection with beauty and permanence.

We also manufacture Balcony Railings, Grilles, Wire and Iron Window Guards, Bridge Railings, Miscellaneous Wire and Iron Work.

Ornamental Iron Fence and Gates

For forty years we have been leaders in the manufacture of iron fence; hundreds of city and municipal cemeteries are among our thousands of installations. Stewart's Iron Fence and Gates are equally popular for town houses, suburban homes, country estates, and other properties where the highest type of enclosure or entrance gateway is required.

SAVE MONEY FOR THE CITY BY GETTING OUR PRICES ON PARK SETTEES.

Let us know your requirements in either Iron or Chainlink Wire Fence and we will submit designs and estimates of cost

THE STEWART IRON WORKS COMPANY.

216 Stewart Block, Cincinnati, O.

"The World's Greatest Iron Fence Builders"

Refuse Collection Wagons Developed by New American Company

While local regulations or by-laws may govern the methods of collection, the various classes of refuse—garbage, rubbish and ashes—remain constant, and for this reason it is imperative from an operating standpoint that a refuse-collection wagon should be capable of transporting the various classes of refuse in combination or separately. Convertible Wagon-Trailers Inc., 120-218 Amherst Street, Buffalo, N. Y., has developed a roller-type, rear-dump refuse-collection wagon with utility slat sides which makes possible the handling of almost any kind of refuse. The upper portion of the sides of this wagon are formed by hinged slat sides, which are raised or lowered as required.

In the case of combined collection of garbage and rubbish, these sides are dropped when loading is begun, thereby reducing to a minimum the driver's reach in loading and, at the same time, speeding up the work of collection. When the load reaches the level of the solid portion of the body, the slat sides are raised, which gives the wagon a capacity of 4 cubic yards level. For the collection of ashes, the slat sides are not utilized, which reduces the body capacity to 2½ cubic yards. In the handling of heavy ash containers, the drop-side construction is a labor-saver. Whether handling rubbish for incineration, or garbage for reduction or incineration, end-dump is usually preferable, as it enables the wagon to back up to the edge of the dumping floor and throw its load completely into the pit. The dumping angle of these wagons is 45 degrees, enabling them to clear themselves very readily at dumps or incinerators.

In order that municipalities in this country purchasing refuse collection wagons and trailers from Convertible Wagon-Trailers Inc., may not have to pay any duty on them, an American company has been organized in addition to the parent Canadian company and will manufacture these garbage and refuse wagons in Buffalo.

A factory building 50 x 175 feet and two stories high has been secured in Buffalo for the manufacture of this equipment. Buffalo was selected because of its convenience as a shipping point to places throughout the United States, and for executive reasons because of its proximity to the Toronto Branch.

A WAGON-TRAILER DUMPING REFUSE AT INCINERATOR

New Junior Partner with Metcalf and Eddy

Metcalf & Eddy, consulting engineers, 14 Beacon Street, Boston, Mass., have announced that John Prescott Wentworth, who has been with them since 1911, has been admitted to the firm as a junior partner.

Mr. Wentworth graduated in 1910 from the Massachusetts Institute of Technology and during the following year was an assistant instructor. In July, 1911, he entered the employ of Metcalf & Eddy, with whom he has remained continuously except for his term of military service. He has acted as resident engineer upon a housing development at Hopedale, Mass., on the construction of the sewerage system at Northeast Harbor, Maine, on the supervision, design and construction of a portion of the sewerage system of Lynn, Mass., and in the detailed valuation of several waterworks companies. In September, 1917, he was commissioned First Lieutenant in the Sanitary Corps, and was promoted to Captain in 1918, having served as camp sanitary officer in several camps. From 1913 to 1915 he was a member of the Planning Board of the city of Malden, Mass. He has been active in the Boston Society of Civil Engineers, having served as Clerk, Vice-Chairman and Chairman of the Sanitary Section. He is also Editor and Advertising Agent of the *Journal* of the New England Water Works Association.

John L. Ford Joins Ford Meter Box Company

The third son of E. H. Ford, President of the Ford Meter Box Company, Wabash, Ind., has joined that organization as a traveling salesman. John L. Ford graduated in 1920 from Purdue University as a chemical engineer. Immediately after leaving the University, he became associated with the Worthington Pump & Machinery Corporation in its Sales Department, and held that position until January 1 of this year.

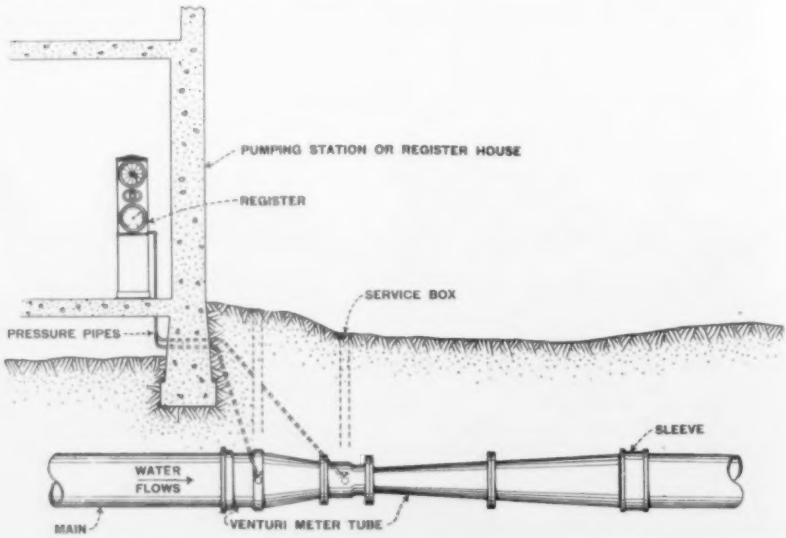
PRESENT CONSERVATION MEANS FUTURE DIVIDENDS

TO KNOW the day and night rates of water consumption per capita for each season of the year

TO KNOW the amount of abnormal demands on the system

TO KNOW the extent and time of occurrence of pipe line breaks and other wastage

IS VITAL to a progressive water department



Thousands of towns and cities are planning wisely for the future through the daily records from *Venturi* METERS on the main supply lines

Bulletin No. 209 tells more

BUILDERS IRON FOUNDRY
PROVIDENCE, R. I.

"Builders of Venturi for 33 Years"

A Successful Highway Safety Guard

For some time safety nets have been used beneath construction workers and in rescuing people from burning buildings. It has remained for the Page Steel and Wire Company, 215 North Michigan Avenue, Chicago, Ill., to bring out a successful highway safety guard which applies the principle of the aerial life-net to prevent embankment, bridge and curve accidents, which cost the lives of hundreds of motorists annually. The appliance is a ribbon of woven wire so fabricated as to absorb impact. It is designed to replace wooden rails, stone walls and cables along highway danger points. Placed at the top of curves and cliffs and at bridge approaches and sides, it stops skidding and speeding machines that hit it, by the stretch of its fabric without destructive impact and without the ordinarily serious damage to the car or injury to occupants.

Tests of this guard demonstrated that it is impossible for a machine speeding as high as 45 miles an hour to break through it, according to W. T. Kyle, General Manager of the Page Steel and Wire Company. He says: "Forty per cent of highway accidents and many of those in cities result from cars going over cliffs or bridge sides. Highway engineers have for years been searching for a guard to replace wooden rails, which 'serve merely as a warning, and stone walls and cables, which, if hit with any violence, break through or wreck the machine because of the impact."

The Highway Guard is built under a method of fabricating wire which gives maximum strength, elasticity and recoil. Machines hitting it at a moderate speed were brought to a stop, the recoil pulling them back from danger. With the machine going at high speed, the meshes, giving uniformly, simply wrap around the hood, allowing the blow to spend itself evenly on the wheels, bumper, etc. Even though the blow might displace a post, in such a case the fastenings farther away hold, and the car is stopped.

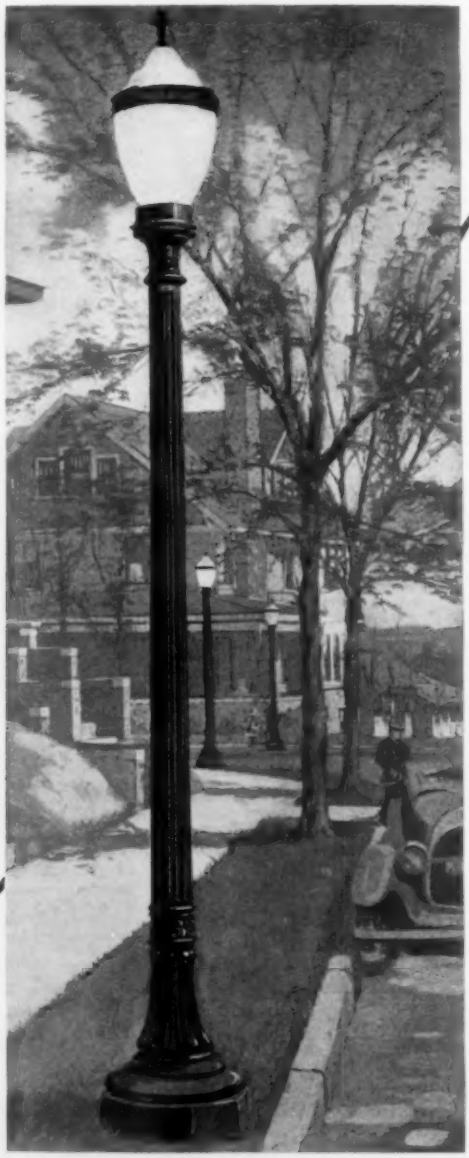
In comparative tests conducted before the Connecticut state highway officials with 4,000-pound machines going 20 miles an hour, the guard was only slightly affected and the cars were not damaged. Standard wooden railings hit at the same speed were totally wrecked and the cars went completely through them and were badly damaged.

The guard can be installed in continuous lengths for any distance, and if one section is caused to sag by a blow, that section can be replaced. Sections on either side of the damaged portion are not affected. The guard is galvanized and painted white, making it easily visible at night. It is constructed of 24-inch wire link fabric. The mesh formed

A NEW TYPE OF GUARD FOR DANGEROUS POINTS ALONG HEAVY-TRAFFIC ROADS

Illustration is from an oil painting of King Standard as installed at Kansas City, Kansas.

Richly designed, built substantially—King Ornamental Lighting Standards equipped with General Electric Novalux lighting units—provide a beautiful, economical, efficient system of illumination.



KING MANUFACTURING CO
ORNAMENTAL LIGHTING STANDARDS
230 South Clark St. Chicago USA

by No. 9 wire is square, measuring 1½ x 1½ inches. The Ohio State Highway Commission has ordered it installed immediately at a famous "death curve" at Columbus, Ohio, and other state highway departments are including it in their specifications.

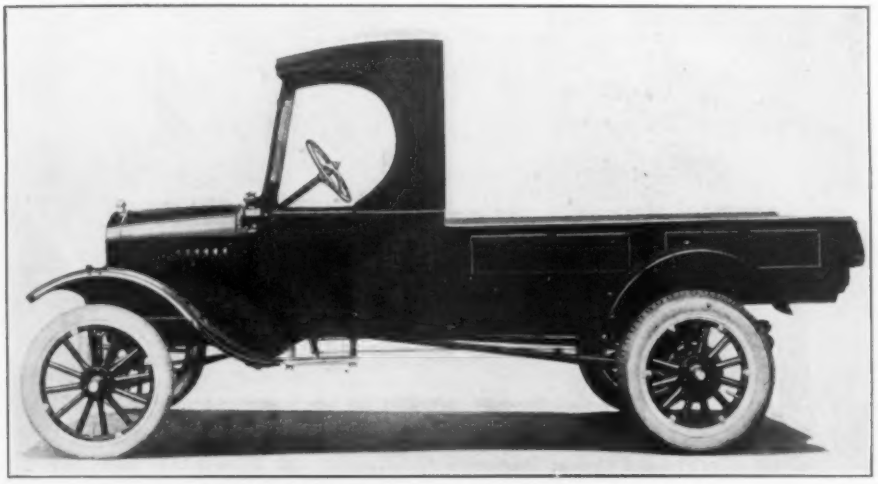
One-Ton Trucks with Steel Cab and Truck Body

An all-steel combination truck body and cab mounted on the standard Ford one-ton chassis, which will be sold as a complete unit, has recently been announced by the Ford Motor Company, Detroit, Mich. The new body is of the open express type, so constructed that it may be readily converted into other body combinations by using stakes, sideboards, a canopy top or screen sides. The purpose of producing this body, according to the Ford Motor Company, was to place a low-cost general-utility truck meeting both agricultural and commercial requirements at the disposal of the users of one-ton trucks. The body is built of steel to withstand severe use and presents a new development in construction. The steel sills are reinforced with wood, in order to lessen vibration and road shocks, thus making for more durability and longer life. The loading space is 7 feet 2 inches in length by 4 feet in width and of convenient and practical depth. The end gate is strongly braced and secured by heavy chains, which hold it in position when lowered.

The cab, also of steel construction, is extra roomy. The seat is of artificial leather, well-cushioned on 4-inch springs. Protection from the weather is afforded by close-fitting door curtains mounted on uprights and opening and closing with the door. An oblong window in the back of the cab gives ample facilities for rear vision, adding to the safety as well as the convenience of the driver.

Gordon Becomes Partner of Dabney H. Maury

Dabney H. Maury, consulting engineer, has announced that Fred G. Gordon, formerly his principal assistant, has become associated with him as partner, under the firm name Maury & Gordon. They will continue the practice of hydraulic, sanitary and mechanical engineering, including investigations, reports, designs, estimates and supervision of construction for water-works, water purification plants, sewerage systems, sewage disposal plants, power-plants and water-power developments and the appraisal of public utilities. Their office is at 1445 Monadnock Block, Chicago, Ill.



LIGHT-WEIGHT TRUCK WITH STEEL BODY AND CAB

Changes in Hazard Sales Organization

The Hazard Manufacturing Company, Wilkes-Barre, Pa., has announced that Daniel J. Morgan, for several years Sales Agent of the Insulated Wire Department, has been appointed Sales Engineer, with general offices at Wilkes-Barre. Mr. Morgan entered the employ of the company in 1900 and has held various positions with the manufacturing department and sales office until 1917, when he was appointed Sales Agent.

Leroy W. Allen has been appointed Sales Engineer of the New York Office of the Hazard Manufacturing Company and will make his headquarters with that office at 533 Canal Street. Mr. Allen entered the employ of the Hazard Manufacturing Company in 1903 and has been connected with the sales organization of that company in New York, Chicago, and Wilkes-Barre.

Why Montgomery now paves *with native-lake asphalt*

Perry Street, Montgomery, Ala., paved with Bermudez (Native-Lake) Asphalt eleven years ago and still in almost perfect condition. Not a cent has been spent on repairs.

Eleven years old—still in splendid condition—and not one cent spent to date for maintenance or repairs! This is the "service record" of the Bermudez (Native-Lake) Asphalt paving in Montgomery, Alabama.

And that's why the city of Montgomery is now laying 46,419 additional square yards of Bermudez paving, and why 38,500 square yards are being laid in Cloverdale, a suburb.

Nothing equals the native-lake asphalts—Trinidad and Bermudez—for long-life, low-cost pavements. Thousands of streets and highways all over the world prove it. Write at once for interesting data.

THE BARBER ASPHALT COMPANY

PHILADELPHIA

New York, Chicago, Pittsburgh, St. Louis, Kansas City, San Francisco

TRINIDAD and BERMUDEZ

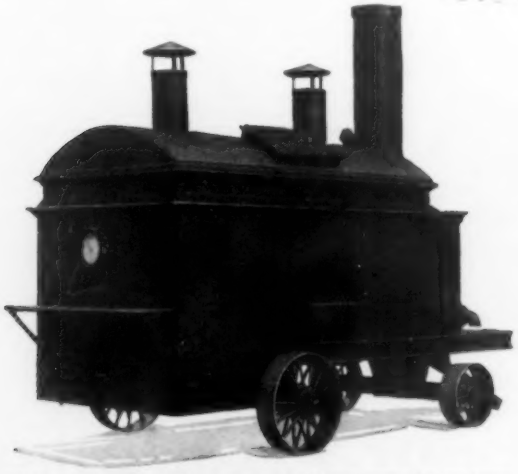
The Native Lake Asphalts

When writing to Advertisers please mention THE AMERICAN CITY—Thank you.

A New Asphalt-Producing Plant

Contractors and highway officials doing a considerable amount of asphalt work will find the Littleford-Pullar asphalt-producing plant of special interest. This plant is a complete unit in itself and produces any kind of asphalt from flux oil. It is capable of producing asphalt for penetration work, asphalt cement for asphaltic concrete or sheet asphalt streets, and asphalt filler for brick work. The plant has been under practical test during the past year and has met with all standard specifications in from four to six hours, which is fully as quick as solid filler can be melted. It is said that the saving in cost to the street department is a considerable item. Asphalt cement for penetration asphalt can be produced in less time and made to meet any of the standard specifications; it is thus only necessary to keep on hand the flux oil instead of the various types of asphalt necessary for different kinds of work. The plant and the method of producing asphalt are so simple that one man is capable of taking care of the entire operation.

This Littleford-Pullar plant was designed by H. B. Pullar, Manager of the Flux and Road Oil Department of the Indian Refining Company, Lawrenceville, Ill. Mr. Pullar is one of the early advocates of blown asphalts and has been intimately associated with the production of this class of asphalt for the last 15 years. He has designed and acted in a consulting capacity for some of the largest asphalt-blowing plants in the country. The simplicity and practicability of this new portable asphalt-producing plant is the result of years of experience in trying to find a practical method of the economical and efficient production of asphalt on the job. Littleford Brothers, 500 East Pearl Street, Cincinnati, Ohio, have the exclusive manufacturing rights for the plant and will distribute it through their own sales organization.



REAR VIEW OF THE NEW LITTLEFORD-PULLAR BLOWN-ASPHALT MACHINE

New Eastern Manager for Graver

The Graver Corporation, East Chicago, Ind., manufacturers of tanks, water-softeners, filters, and general steel plate construction work, have announced the appointment of L. H. Welling as Manager of their eastern office, 5045 Grand Central Terminal Building, New York City.

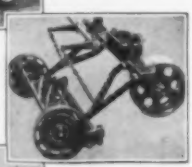
Water Works Manufacturers Association Committees for 1924

The Exhibit Committee of the Water Works Manufacturers Association, to handle the conventions for 1924, comprises J. E. O'Leary, *Pittsburgh-Des Moines Steel Company*, chairman; J. D. Capron, *U. S. Cast Iron Pipe Company*, Burlington, N. J.; and Charles M. Reed, *Central Foundry Company*, New York City.

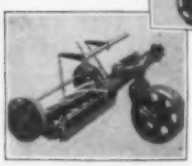
The Entertainment Committee of the Water Works Manufacturers Association for the American Water Works Association Convention is as follows: Burt B. Hodgman, *National Water Main Cleaning Company*, New York City, chairman; John S. Warde, *Rensselaer Valve Company*, New York City, vice-chairman; W. C. Sherwood, *Hersey Manufacturing Company*, New York City; E. L. Cantrell, *Neptune Meter Company*, New York City; Charles Becker, *R. D. Wood & Company*, Philadelphia, Pa.; W. R. James, *H. Mueller Manufacturing Company*, New York City; and Theodore R. Kendall, THE AMERICAN CITY, New York City.

Increased Prices for Liquid Chlorine and Bleach

The Mathieson Alkali Works, Inc., 25 West 43rd Street, New York City, has announced an advance in prices for liquid chlorine and bleaching powder, f. o. b. Niagara Falls. Bleaching powder for spot sales and contracts for future delivery in car-load lots shipped in 700-pound drums is $1.75 per 100 pounds, and $2 per 100 pounds in 300- and 400-pound drums. Shipments in less than car-loads not on contract are 15 cents per 100 pounds above these prices. Liquid chlorine for spot sales and contracts for future delivery in tank-car lots and cylinders, f. o. b. Niagara Falls is $4 per 100 pounds in single units or multi-units, $5 per 100 pounds in cylinders in car-load lots, $5.50 in cylinders for sales of more than one ton, and $6 per 100 pounds in cylinders for sales of one ton and less.



Compact arrangement of cutting units makes control easy.



Two views showing how units are pushed —not pulled, the lifting arrangement and absence of weight on cutting units.

Golf Clubs Demanded Them
—Here they are—
"Bulldog" Cutting Units for Tractor Hitch

There's seldom a day when we don't get letters saying that Ideal "Bulldog" cutting units give two, three and four times the service given by any other unit without adjustment or repairs. In just three years their sturdiness has become the wonder of the grass cutting field.

So outstanding is this superiority that we have received hundreds of requests to furnish them for tractor hitch, in addition to use on the Ideal Mowers for which they were originally designed. Golf clubs *demanded* them—here they are.

The new Ideal "Bulldog" Mower—3 and 5 units—is designed for use with the Fordson or any other tractor, or can be furnished horse-drawn. It has many outstanding features. First there is the "Bulldog" cutting units, with their Timken bearings, Alemite Lubrication, patented double-locked adjustments, special alloy steels and proven sturdiness. Second, these units are *pushed* individually, as they should be. Third there is no weight on the units themselves. Fourth the short turning radius and fifth the ease with which the units are raised.

Ideal "Bulldog" Mowers will give continuous performance beyond your fondest hopes. If cutting unit failure has given you trouble in the past—here is its end. Write for details.

Ideal Power Lawn Mower Company
R. E. Olds, Chairman
400 Kalamazoo Street, Lansing, Michigan
NEW YORK, 13-19 Hudson Street
CHICAGO, 11 East Harrison Street
Dealers in all Principal Cities (82)

IDEAL *Bulldog* MOWERS
3 and 5 Units

When writing to Advertisers please mention THE AMERICAN CITY—Thank you.

A Shelter for Traffic Officers

The portable shelter for traffic officers described on page 235 of the February, 1924, issue of THE AMERICAN CITY, is manufactured by J. A. McKelvy & Company, Harrisburg, Pa.

Sludge Conveyors for Sedimentation Tanks

The township of Pensauken and the borough of Merchantville, N. J., have recently installed a joint sewage disposal plant. Pensauken needed a sewage disposal plant and was considering the installation of a new treatment plant, and the borough of Merchantville was experiencing a serious overload in its old septic tank. Through the efforts of the consulting engineers, the two communities decided to combine their resources and build a community disposal system, furnishing immediately increased disposal facilities for both communities, a plant that would care for future requirements, the utilization of the old septic tank then in use, and economy in construction costs.

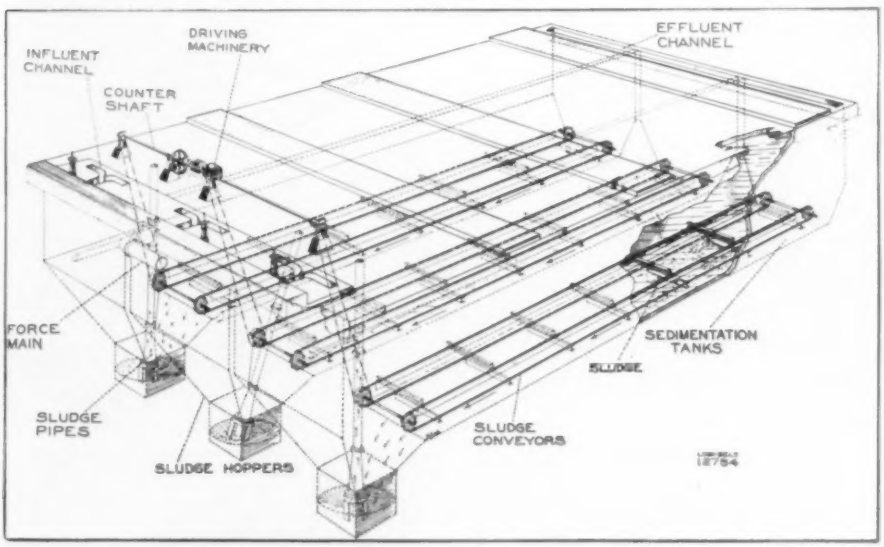
The sedimentation tanks for the new disposal plant were started on the site of the old septic tank. The plans make use of the old septic tank for the digestion of the settled solids. Link-Belt sludge conveyors are employed in the new sedimentation tanks to move the settled material into sludge hoppers, from which it is periodically withdrawn into the digestion tanks. These conveyors make possible the use of long and comparatively shallow settling-tanks, which are not only highly efficient and low in construction cost, but also particularly advantageous in this instance in that to excavate deeper would mean to enter quicksand, thus incurring high expense in the building of a foundation. The conveyors and all driving machinery were supplied by the Link-Belt Company, Philadelphia, Pa.

Power-Plant Consultant

Theodore Maynz, who for the last four years has been in charge of the Testing, Efficiency and Results Department of the Cleveland Electric Illuminating Company, Cleveland, has severed his connection with that company and is now prepared to give consulting service on the utilization of fuel and the generation and application of steam and electric power in all its phases. Mr. Maynz was formerly connected with the Interborough Rapid Transit Company, of New York City; the Combustion Engineering Corporation, of New York; the Federal Light and Traction Company, of New York; and the Gulf Oil Corporation, of Texas. His address is 3326 Kenmore Road, Shaker Heights, Cleveland, Ohio.

New Plant of Chicago Concrete Post Company

Since the Chicago Concrete Post Company, Lawrence, Lamon & Leland Avenues, Chicago, Ill., reorganized last May, the former stockholders have been bought out completely, so that the company is no longer connected financially or otherwise with any contracting company. The capitalization has been greatly increased and the manufacturing capacity enlarged to 100 concrete poles per day. Arrangements have been made with the Western Electric Company for the distribution of Chicago concrete lighting standards throughout the United States. Paul K. Fleming, President, extends a welcome to engineers to inspect the plant and the particular process of manufacture used in making Chicago ornamental concrete lighting standards.



SLUDGE CONVEYOR IN COMMUNITY SEWAGE PLANT

Milwaukee's Parks Are Kept Beautiful With 16 Jacobsen 4-Acre Power Lawn Mowers

The first mower sold the other fifteen because it enabled one man to do the work of 4 or 5 men with hand mowers—do it better and cheaper.

Trouble-free, dependable performance; easy steering and close-up work about flower beds, trees, etc., made possible by Automobile type of differential in the Jacobsen; powerful, specially built motor; self-sharpening reel; independent clutch control on wheels and cutting unit—these and other distinctive features make the Jacobsen 4-Acre Mower a favorite with the municipal park boards. The Jacobsen soon saves its own purchase price.

Write for Free Book "Lawns Beautiful"

Describes the mowers in detail, pictures many beautiful lawns and gives the experiences of users.

Special Putting Green Mower For Municipal Golf Courses

Let us show you how to have faster greens at 50 to 75 percent lower cost.

Ask for *Putting Green Folder*

JACOBSEN MFG. CO.
Dept. E Racine, Wis.

TAR KETTLES
SAND DRYERS
TOOL HEATERS

Portable Kettles 50 to 900 Gallons

Stationary 25 to 200 Gallons

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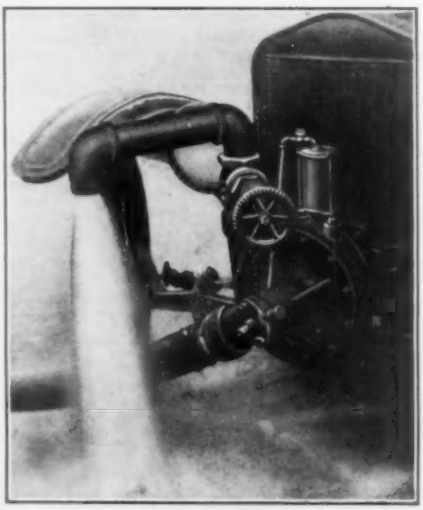
THE JOSEPH HONHORST CO.
1016 W. 6th ST. CINCINNATI, O.

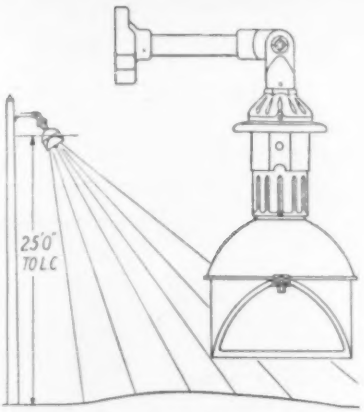


The BARTON Portable Pumper
Is Equipped with Automatic Primer

Eliminates all priming trouble and gives the pump a capacity of from one to four hundred gallon per minute.

Write for complete information

BARTON PRODUCTS COMPANY
JACKSON, MICH.



SKETCH AND DIAGRAM OF HIGHWAY LIGHTING UNIT

Lighting Interurban Highways

The proper lighting of highways is accomplished by providing a clear view of the whole roadway a considerable distance ahead of the car and eliminating glare within the range of vision of the driver.

The Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has developed a highway lighting unit which consists of a porcelain housing containing a series socket for a Type C Mazda lamp, a reflector and a double set of refracting prisms. The units arranged for suspension from a series of interchangeable fittings to be fastened to brackets, mast-arms or span-wires as mounting conditions require. The reflector is made of copper, highly polished and lacquered on the inside. Its shape is parabolic and so arranged with relation to the refraction prisms that all of the light is thrown in a direction parallel to the roadway. Most of the light is controlled by the upper parabolic reflector, which redirects the rays vertically downward upon the two sets of refracting prisms and thence to the road surface in the two directions in which it is most needed.

New Yeomans Offices

Yeomans Brothers Company, 1417 Dayton Street, Chicago, Ill., has announced the establishment of two new district sales agencies. The northwestern Ohio territory is to be covered from the new office at 752 Euclid Avenue, Toledo, Ohio, in charge of A. Carle Rogers. The central and northwestern Washington territory is to be handled from the new office at 2021 L. C. Smith Building, Seattle, Wash., by the Godfrey Jones Company.

Wire for Police and Fire-Alarm Circuits

Overhead circuits for police and fire-alarm service must consist of weather-proof wires, possessing safety, moderate cost and proper electrical properties. Reliability and uninterrupted service are the foremost requirements of overhead wires of every police and fire-alarm system. Comparing the cost of the wires with the value of life and property which they protect and with the important duties they must perform, it is evident that consideration of reliability every day of the year, in winter as well as in summer, must have precedence. Fire and police department records show that apparatus is called out most frequently after sleet or wind storms, which indicates that service is needed when the wires are most liable to be broken.

Municipal engineers who have been using copper or iron wires on overhead lines and who contemplate making new extensions or replacements may secure some helpful information from the loose-leaf book of the Copper Clad Steel Company, Braddock P. O., Rankin, Pa., entitled "Engineering Data — Copperweld." When the electrical properties of an overhead wire are known to be satisfactory for a given alarm circuit, the question of cost may be ranked next in importance to that of safety. It is claimed that Copperweld weather-proof wires cost less than copper or iron wires, even on the basis of first cost of material, and show a saving in ultimate cost.

On loops of certain lengths, Copperweld overhead line wire does not require any greater number of battery cells than solid copper wire requires. Such loops when strung with solid copper wire must have an excess resistance in the line, usually in the adjustable rheostat to keep the current down to proper value. The use of Copperweld wires in such cases does not involve adding any cells, but merely requires eliminating some excess resistance in the adjustable rheostat. On very long loops, a few extra cells may be required when using Copperweld instead of solid copper. The additional cells may be fully justified by the greater safety and reduced maintenance cost of the overhead wire system.

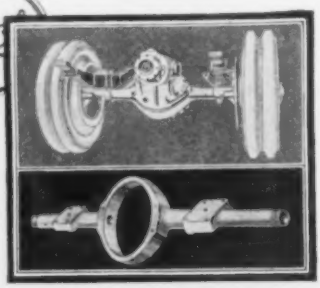
Sullivan Moves Birmingham Office

On February 1, the Birmingham, Ala., office of the Sullivan Machinery Company, 122 South Michigan Avenue, Chicago, Ill., was moved to 2108 Fifth Avenue, North, Birmingham, Ala., where ample floor space provides more adequate accommodations for the company's business than the former quarters in the Brown-Marx Building. G. P. Small is local manager for Alabama.

Manufacturers of fire apparatus and any other equipment or material tending to reduce fire waste are invited to send communications to James J. Mulcahey, Secretary of the International Association of Fire Engineers, Room 301, City Hall, Yonkers, N. Y., so that a discussion may take place at the meeting of the Board of Directors at the New Statler Hotel, Buffalo, N. Y., April 15, 1924, for the purpose of making a special educational feature for fire chiefs and the general public, leading to greater prevention of our fire losses.

—William H. Bywater, President, International Association of Fire Engineers.

Exclusive Features



No. 22 The Dual Reduction Drive.

No. 23 The One-Piece Banjo Type Axle.

THE Mack Dual Reduction Drive is a more efficient drive than either the worm or internal gear. The gears all have a rolling contact and are grouped together and held in alignment by a single solid carrier. The axle proper gives greater road clearance than the worm drive and not only are gear ratio changes made more quickly, but a greater range of changes is possible than in the case of any other type of enclosed drive truck axle.

◆ ◆ ◆

The Mack One-Piece Banjo Type Axle is forged from a single bar of chrome nickel steel and is then heat-treated, machined and finished. It extends from hub cap to hub cap and is the largest drop forging produced in the automotive industry. Riveting, shrinking and bolting are unknown in Mack banjo axle construction.

The 27 exclusive features are the result of 23 years of specializing in motor transportation. Each one has played an important part in building the reputation which Mack Trucks have established wherever motor trucks are known.

Send for illustrated and descriptive literature on all exclusive Mack features.

INTERNATIONAL MOTOR COMPANY
25 Broadway New York City

Branches owned by this company operate under the titles of: "MACK MOTOR TRUCK COMPANY" and "MACK-INTERNATIONAL MOTOR TRUCK CORPORATION."

PERFORMANCE COUNTS

IN CASE OF FIRE DANGEROUS STREET CORNERS

Can be made safe for traffic and fire trucks by

STERLING ELECTRIC SIRENS

Type "F"

A powerful signal that means "FIRE" to everyone.

This is a real "Safety Signal" Let us send you full particulars.

INTER-STATE MACHINE PRODUCTS CO.

ROCHESTER 53 Allen Street, NEW YORK

HUBER ROAD TOOLS
MAINTAINERS - ROLLERS

The Huber Four Cylinder Gasoline Roller starts easily, has surplus power and convenient to handle. Air controlled scarifier folds under when not in use.

The Huber Steam Roller has been standard equipment with road builders for many years. Always dependable. The Huber One-Man Road Maintainer is economical and the four cylinders furnish excess power. Has weight enough to hold blade down when making heavy cut and pulls a detached grader when necessary.

Write for illustrated folders on any Huber Road Tool.

THE HUBER MFG. CO.

106 Center Street, Marion, Ohio